# Mathematics for Class 8

## 1. Rational Numbers

Q 1 Find the reciprocal of -2.

Mark (1)

Q 2 The sum of two numbers is $\dfrac{5}{9}$. If one of the numbers is $\dfrac{1}{3}$, find the other.

Mark (1)

Q 3 Write the additive inverse of $\dfrac{2}{3}$ and show that their sum is zero.

Mark (1)

Q 4 Simplify $\dfrac{7}{6} \times \dfrac{-3}{28}$ and find its reciprocal.

Mark (1)

Q 5 The product of two rational numbers is 15. If one of the numbers is −10, find the other.

Mark (1)

Q 6 Write any three rational numbers between −5 and 0.

Mark (1)

Q 7 True of False: 1 is the only rational number that is equal to its reciprocal.

Mark (1)

Q 8 Simplify: $\dfrac{-4}{13} - \dfrac{-3}{26}$

Marks (2)

Q 9 Verify $\dfrac{-2}{5} + \left[\dfrac{3}{5} + \dfrac{1}{2}\right] = \left[\dfrac{-2}{5} + \dfrac{3}{5}\right] + \dfrac{1}{2}$.

Marks (2)

Q 10 Verify: $\dfrac{1}{2} \div \left[\dfrac{-1}{3} \div \dfrac{2}{5}\right] \neq \left[\dfrac{1}{2} \div \dfrac{-1}{3}\right] \div \dfrac{2}{5}$.

Marks (2)

Q 11 Verify the associative property of multiplication in $\dfrac{-7}{3} \times \left(\dfrac{5}{4} \times \dfrac{2}{9}\right) = \left(\dfrac{-7}{3} \times \dfrac{5}{4}\right) \times \dfrac{2}{9}$.

Marks (2)

Q 12 Find $\dfrac{3}{7} + \dfrac{6}{11} + \left(\dfrac{-8}{21}\right)$

Marks (2)

Q 13 Simplify: $\left[\dfrac{1}{2} \div \left(\dfrac{-1}{2}\right)\right] \div \dfrac{2}{5}$

Marks (2)

Q 14 Find a rational number between $\dfrac{1}{4}$ and $\dfrac{1}{2}$.

Marks (2)

Q 15 Find two rational numbers between –2 and 0.

Marks (2)

Q 16 Find $\dfrac{-6}{5} \times \dfrac{3}{8} \times \dfrac{15}{24} \times \left(\dfrac{-16}{9}\right)$

Marks (2)

Q 17 By what number should $\dfrac{3}{-14}$ be multiplied so as to get $\dfrac{5}{12}$.

Marks (2)

Q 18 Represent -7/4 on the number line.

Marks (2)

Q 19 Divide $\dfrac{1}{2}$ by $\left[\dfrac{-1}{3} + \dfrac{2}{5}\right]$

Marks (2)

**Q 20 Multiply** $\dfrac{-7}{3} \times \left( \dfrac{-5}{4} \times \dfrac{2}{9} \right)$

Marks (2)

**Q 21 Find** $\dfrac{-2}{3} - \left[ \dfrac{-4}{5} - \dfrac{1}{2} \right]$

Marks (2)

**Q 22 Using appropriate properties, find** $\dfrac{-2}{3} \times \dfrac{3}{5} + \dfrac{5}{2} - \dfrac{3}{5} \times \dfrac{1}{6}$

Marks (3)

**Q 23** Find three rational numbers between $-\dfrac{5}{6}$ and $-\dfrac{5}{8}$.

Marks (3)

**Q 24 By what number should** $\dfrac{-33}{8}$ **be divided to get** $\dfrac{-11}{2}$ ?

Marks (3)

**Q 25 Using the distributive property, find** $\dfrac{-3}{4} \times \dfrac{2}{3} + \left( \dfrac{-3}{4} \times \dfrac{-5}{6} \right)$.

Marks (3)

**Q 26 What should be subtracted from** $\dfrac{-2}{3}$ **to get** $\dfrac{5}{6}$ ?

Marks (3)

**Q 27 Find the sum of** $\dfrac{3}{7} + \left( \dfrac{-6}{11} \right) + \left( \dfrac{-8}{21} \right) + \dfrac{5}{22}$.

Marks (3)

**Q 28** Find two rational numbers between $\dfrac{1}{4}$ and $\dfrac{1}{2}$.

Marks (4)

**Q 29** Find three rational numbers between $\dfrac{2}{3}$ and $\dfrac{4}{5}$ .

Marks (4)

**Q 30** Find two rational numbers between $\dfrac{1}{4}$ and $\dfrac{1}{2}$.

Marks (4)

**Q 31** Find three rational number between $\dfrac{3}{5}$ and $\dfrac{3}{4}$.

Marks (4)

**Q 32** Find three rational number between $\dfrac{3}{5}$ and $\dfrac{3}{4}$.

Marks (4)

| Most Important Questions |
|---|

**Q 1** Using appropriate properties of rational numbers, find the sum

$$\frac{3}{4}+\frac{4}{21}+\frac{7}{8}+\frac{5}{7}$$

**Q 2** Using appropriate properties of rational numbers, find

$$-\frac{5}{12}\times\frac{3}{16}-\frac{3}{8}+\frac{7}{8}\times\frac{5}{7}$$

**Q 3** What is additive identity of rational number?

**Q 4** Find the additive inverse of (i) $\dfrac{4}{21}$  (ii) $-\dfrac{7}{11}$  (iii) $\dfrac{9}{-2}$  (iv) $2\dfrac{3}{7}$

**Q 5** What is multiplicative identity of rational number?

Q 6 Find the multiplicative inverse of

(i) $\frac{3}{11}$    (ii) $-\frac{2}{7}$    (iii) $\frac{-9}{-2}$    (iv) $1\frac{8}{9}$

Q 7 Add $\frac{4}{13}$ with the multiplicative inverse of $5\frac{1}{5}$.

Q 8 Add $-\frac{2}{5} \times \frac{15}{4}$ by the reciprocal of $\frac{4}{13} \times \frac{-39}{5}$.

Q 9 Is 0.15 is the multiplicative inverse of $-6\frac{2}{3}$ ?

Q 10 Add the multiplicative inverses of 3/8 and 7/12.

Q 11 Multiply the additive inverses of $\frac{3}{8}$ and $\frac{7}{12}$.

Q 12 Verify $-(-x) = x$ for $x = \frac{7}{12}$.

Q 13 For $a = \frac{2}{3}$, $b = -\frac{5}{6}$ and $c = \frac{1}{2}$, prove that $a \times (b+c) = a \times b + a \times c$.

Q 14 Using appropriate properties of rational numbers, find $\left[\frac{7}{11} + \left(\frac{5}{7} + \frac{3}{22}\right)\right]$.

Q 15 Find $\left[-\frac{2}{5} \times \left(\frac{5}{3} \times \frac{15}{22}\right)\right]$.

Q 16 Represent the rational number 12/5 on the number line.

Q 17 Represent the rational number 13/6 on the number line.

Q 18 Represent the rational numbers 2/9, 5/9, 8/9 on a number line.

Q 19 Find two rational numbers between 0 and 7/9.

Q 20 Find five rational numbers between 3/5 and 2/3.

Q 21 Find four rational numbers between 7/9 and 1/3.

Q 22 Find ten rational numbers between – 1/10 and – 2/5.

Q 23 Find five rational numbers less than – 3.

Q 24 Find ten rational numbers greater than 4.

# 2. **Linear Equations in One Variable**

Q 1 Solve the equation: $\dfrac{1}{x} + \dfrac{2}{x} = 3$ .

Mark (1)

Q 2 The two third of a number increased by 9 equals 19. Find the number.

Mark (1)

Q 3 Solve the equation: $\dfrac{6}{2x - (3 - 4x)} = \dfrac{2}{3}$

Mark (1)

Q 4 Solve the equation: $\dfrac{2x}{3x + 1} = -3.$

Mark (1)

Q 5 Solve the equation: 5x - 3 = 3x - 5

Mark (1)

Q 6 Solve the equation: $\dfrac{5x - 7}{3x} = 2$

Mark (1)

Q 7 Solve the equation: $\dfrac{x}{5} + 1 = \dfrac{1}{15}$

Marks (2)

Q 8 Solve the equation: $x - 2x + 2 - \dfrac{16}{2}x = 3 - \dfrac{7}{2}x$

Marks (2)

Q 9 Solve the equation: $\dfrac{x^2 + 4}{3x^2 + 7} = \dfrac{1}{2}$

Marks (2)

Q 10 Solve the equation:

$$\frac{\frac{3}{4}y + 7}{\frac{2}{5}y - 4} = \frac{5}{4}$$

Marks (2)

Q 11 If $\frac{1}{2}$ is subtracted from a number and the difference is multipled by 4, the result is 5. Find the number.

Marks (2)

Q 12 Solve the equation: 0.6x + 0.8 = 0.28x + 1.16

Marks (2)

Q 13 Solve the equation:

$$\frac{3x + 5}{2x + 7} = 4$$

Marks (2)

Q 14 Solve the equation:

$$4(3w + 2) - 5(6w - 1) = 2(w - 8) - 6(7w - 4) + 4w$$

Marks (2)

Q 15 The sum of two numbers is 52. The second number is 10 more than the first. Find the numbers.

Marks (2)

Q 16 The sum of three consecutive even integers is 270. Find the integers.

Marks (2)

Q 17 The sum of three consecutive integers is 246. Find the integers.

Marks (2)

Q 18 The sum of three consecutive multiples of 7 is 777, find the numbers.

Marks (2)

Q 19 The ratio of two complementary angles is 4 : 5. Find these angles and ratio of their supplementary angles.

Marks (2)

Q 20 The sum of the digits of a two-digit number is 14. If 36 is added to the number, its digits are interchanged. Find the number.

Marks (2)

Q 21 Solve for x: 4x + 7 = 10 + 2x

Marks (2)

Q 22 Solve for p: 0.25 (4p - 3) = 0.05 (10p - 9)

Marks (2)

Q 23 The perimeter of a triangle is 49 cm. The one side is 7 cm longer than the other and 5 cm shorter than the third. Find the length of each side of the triangle.

Marks (3)

Q 24 Nisha has a rectangular plot of land that has been fenced with 300 m long wires. Find the dimensions of the plot, if its length is twice the breadth.

Marks (3)

Q 25 Each side of a triangle is increased by 10 cm; if the ratio of the perimeter of the new triangle and the given triangle is 5 : 4, find the perimeter of the given triangle.

Marks (3)

Q 26 The length of a rectangle is 15 cm more than its width. The perimeter is 150 cm. Find the dimensions of the rectangle.

Marks (3)

Q 27 The sum of two numbers is 184. One-third of one number exceeds one-seventh of the other number by 8. Find the two numbers.

Marks (3)

Q 28 Solve for x: 3(5x - 5) - 2(9x - 8) = 4(8x - 13) - 17

Marks (3)

Q 29 The present ages of Veeru and Neeru are in the ratio 3:4. Five years from now, the ratio of their ages will be 4:5. Find their present ages.

Marks (4)

Q 30 The denominator of a rational number is greater than its numerator by 8. If the numerator is increased by 17 and the denominator is decreased by 1, the number obtained is 3/2. Find the rational number.

Marks (4)

Q 31 The sum of the weights of an iron piece and of a copper piece is 1280 gm. The volume of the copper piece is twice that of the iron piece. If the weight of 1 cubic centimeter of iron is 7.8 gm and that of copper is 8.9 gm. Find the volume of each piece.

Marks (4)

Q 32 Srishti has a total of Rs 780 as currency notes in the denominations of Rs 10, Rs 20 and Rs 50. The ratio of the number of Rs 50 notes and Rs 10 notes is 3 : 2. If she has a total of 32 notes, how many notes of each denomination she has?

Marks (4)

Q 33 Reeta received a certain amount of money on her retirement from her company. She gives half of this money and additional sum of Rs 10,000 to her daughter. She also gives one third of the money received and an additional sum of Rs 3000 to her son. If the daughter gets twice as much as her son, find the total amount of money Reeta received from her company.

Marks (4)

Q 34 The denominator of a rational number is greater than its numerator by 8. If the numerator is increased by 17 and the denominator is decreased by 1, the number obtained is 3/2. Find the rational number.

Marks (4)

Q 35 Five years before, the age of Neeraj and Neera was in the ratio 4:5. The ratio of their present ages is 5:6. Find their present ages.

Marks (4)

Q 36 The sum of three consecutive multiples of 8 is 792. Find these multiples.

Marks (4)

Q 37 The sum of three consecutive multiples of 9 is 795. Find these multiples.

Marks (4)

Q 38 Five years before, the age of Neeraj and Neera was in the ratio 4:5. The ratio of their present ages is 5:6. Find their present ages.

Marks (4)

Q 39 The present ages of Veeru and Neeru are in the ratio 3:4. Five years from now, the ratio of their ages will be 4:5. Find their present ages.

Marks (4)

## Most Important Questions

Q 1 Solve: $-3(x+2) = -12$

Q 2 $5a + 5 = 20$

Q 3 $-2 + g = 7$

Q 4 $7a + 2 = -12$

Q 5 If $3x + 2 = 12$, then find the value of $6x + 4$.

Q 6 Solve the following equation: $2(7b + 12) = 24$

Q 7 $4 - 5x = -21$

Q 8 If $11x - 7 = 26$, then find the value of the expression $(x - 3)$.

Q 9 Sum of three consecutive even integers is 270. Find the integers.

Q 10 Sum of two numbers is 52; if second number is 10 more than first, find the number.

Q 11 Sum of three consecutive multiples of 7 is 777 find the numbers.

Q 12 The ratio of two complementary angles is 4 : 5. Find these angles and ratio of their supplementary angles.

Q 13  Nisha has rectangular plot of land that has been fenced with 300m long wires. Find the dimensions of the plot, if its length is twice the breadth.

Q 14 The length of a rectangle is 15 cm more than its width. The perimeter is 150 cm. Find the dimensions of the rectangle.

Q 15 Naveen's present age is three times of age of his son. After 5 years the difference between the ages of both is 30. Find the present age of Naveen.

Q 16 Solve the equation:5x - 3 = 3x - 5.

Q 17 $$5x - \frac{3}{2} = 2x + \frac{7}{2}$$

Q 18 Simplify : 3t + (t – 2) = 2 – 5t

Q 19 $$\frac{3x}{2} - \frac{3}{2} = \frac{5x}{2} + \frac{7}{2}$$

Q 20 Simplify : $$m = \frac{4}{5}(m - 10)$$

Q 21 Simplify : 0.03a + 2 = 8 - 0.02x + 2(0.6x + 1)

Q 22 Solve the equation 0.6x + 0.8 = 0.28x + 1.16.

Q 23 Solve the equation: $$4(3w + 2) - 5(6w - 1) = 2(w - 8) - 6(7w - 4) + 4w$$.

Q 24 The sum of the digits of a two-digit number is 8. If 18 is subtracted from the number, its digits are interchanged. Find the number.

Q 25 A steamer is going downstream in a river and cover a distance between two villages in 20 hours and same distance it covers in 25 hours when he return back in upstream if the speed of the river is 4 km/h. Find the distance between two villages.

Q 26 Solve the equation:1/x +2/x = 3.

Q 27 Solve the equation: $$\frac{\frac{3}{4}y + 7}{\frac{2}{5}y - 4} = \frac{5}{4}$$.

Q 28 Solve the equation: $$\frac{6x + 3}{2} + 1 = \frac{x - 2}{6}$$.

Q 29 If two third of a number is increased by 9, sum will be 19 find the number.

Q 30 Solve the equation : $\dfrac{a}{2} - \dfrac{3a}{4} = 21 - \dfrac{5a}{6}$ .

Q 31 If $\dfrac{1}{2}$ is subtracted from a number and difference is multiple by 4, the result is 5 find the number.

Q 32 Solve the equation : $x - 2x + 2 - \dfrac{16}{2}x = 3 - \dfrac{7}{2}x$ .

Q 33 $y - \dfrac{y-1}{2} = 1 - \dfrac{y-2}{3}$

Q 34 The sum of the weights of an iron piece and of a copper piece is 1280 gm. The volume of the copper piece is twice that of the iron piece. If the weight of 1 cubic centimeter of iron is 7.8gm and that of copper is 8.9 gm, find the volume of each piece.

Q 35 Reeta receives a certain amount of money on her retirement from her company. She gives half of this money and additional sum of Rs. 10000 to her daughter. She also gives one third of the money received and an additional sum of Rs. 3000 to her son. If the daughter gets twice as much as her son, find the total amount of money Reeta received from her company.

Q 36 Present ages of Seema and Sharad are in the ratio 5 : 6. Twelve years from now the ratio of their ages will be 9 : 10. Find their present ages.

# 3. Understanding Quadrilaterals

Q 1 Name the regular polygon with 8 sides.

Mark (1)

Q 2 Find the number of diagonals in the figure given below.
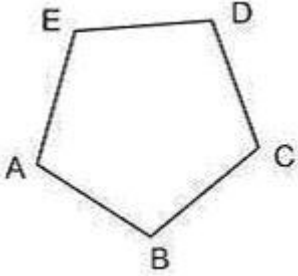


Mark (1)

Q 3 Find x in the following figure.
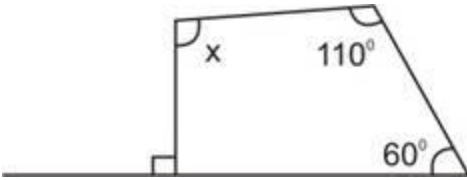


Mark (1)

Q 4 Find the measure of each exterior angle of a regular polygon of 9 sides.

Mark (1)

Q 5 Name the quadrilateral whose diagonals are perpendicular bisector of each other.

Mark (1)

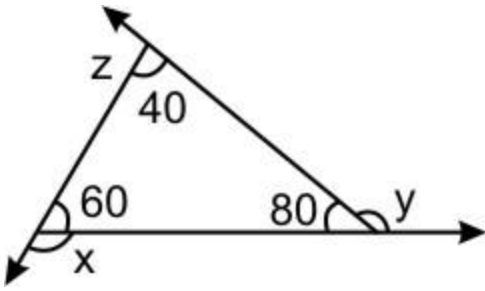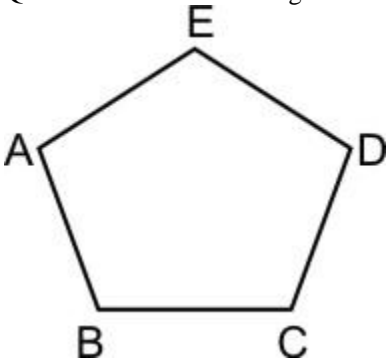Q 6 Name a quadrilateral with exactly one pair of parallel sides.

Mark (1)

Q 7 Find x in the following figure.
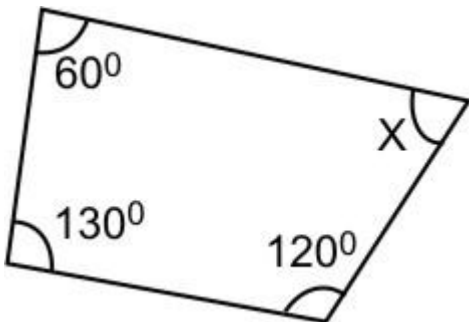


Marks (2)

Q 8 Use the figure given below to find x + y + z.



Marks (2)

Q 9 Find the sum of the angles in the figure given below.



Marks (2)

Q 10 Find the sum of the angles in the following figure.
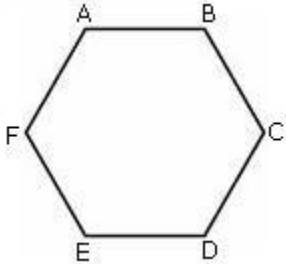


Marks (2)

Q 11 Find the number of sides of a regular polygon whose each exterior angle has a measure of $60^{\circ}$.

Marks (2)

Q 12 ABCD is a trapezium in which AB $\parallel$ DC. If $\angle A = \angle B = 40^{\circ}$, find the measures of other two angles.
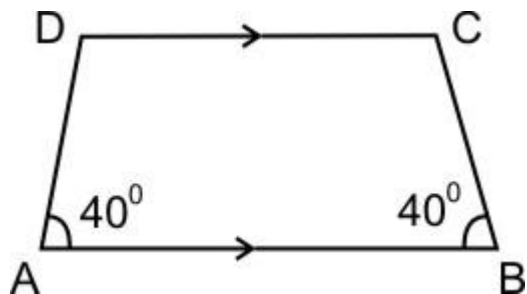


Marks (2)

Q 13 The length of two adjacent sides of a parallelogram are 4 cm and 3 cm. Find its perimeter.

Marks (2)

Q 14 In the following figure, given a parallelogram ABCD. Find x and y.



Marks (2)

Q 15 The diagonals AC and BD of rectangle ABCD intersect each other at point O. If OA = 5 cm, find AC and BD.
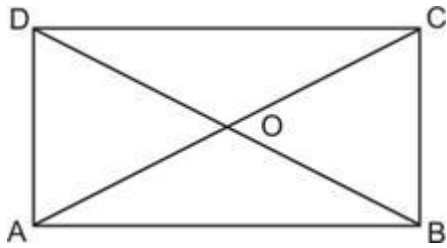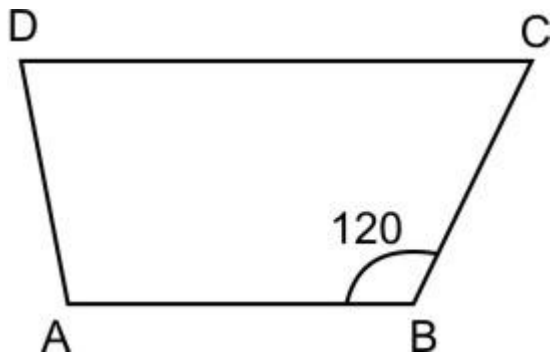


Marks (2)

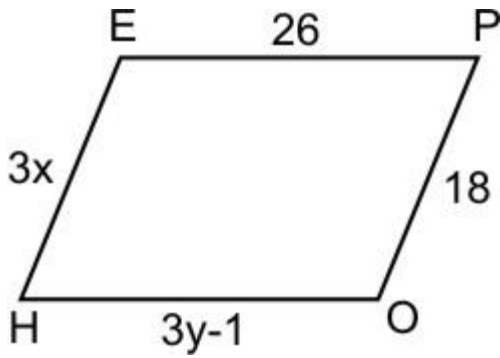Q 16 In parallelogram PQRS, given that OQ = 4 cm, and PR is 5 more than SQ. Find OP.
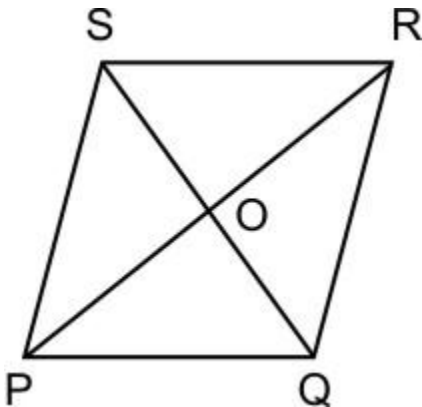


Marks (2)

Q 17 Given ABCD is a trapezium. Find m∠C.
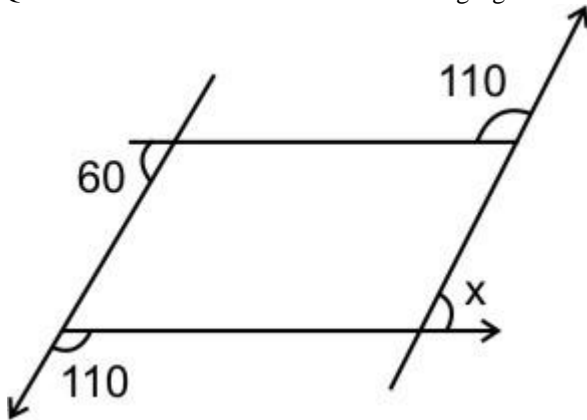


Marks (2)

Q 18 In parallelogram HOPE, find x and y.



Marks (2)

Q 19 Find the measure of x in the following figure.
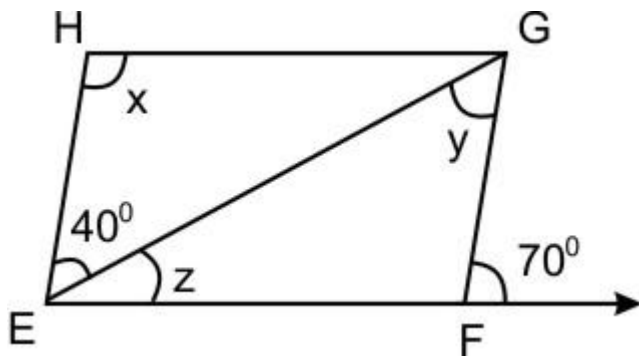


Marks (2)

Q 20 The measure of two adjacent angles of a parallelogram are in the ratio of 2 : 3. Find the measure of each of the angles of the parallelogram.

Marks (3)

Q 21 Two adjacent angles of a parallelogram have equal measure. Find the measure of each of the angles of the parallelogram.
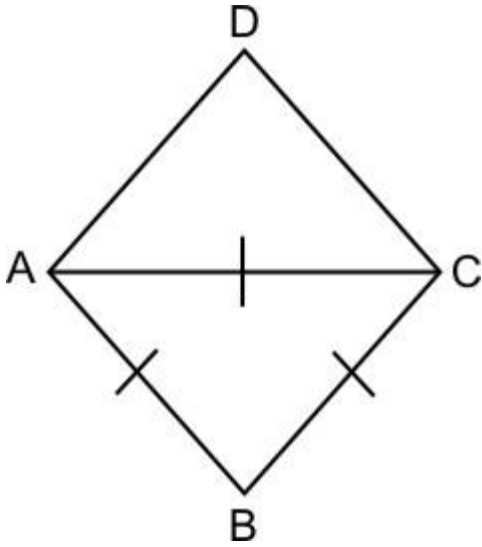
Marks (3)

Q 22 EFGH is a parallelogram. Find the angle measures x, y and z.



Marks (3)

Q 23 The diagonal AC of rhombus ABCD is equal to one of its sides BC. Find all the angles of rhombus.
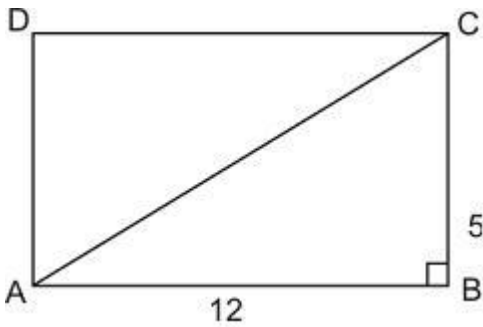


Marks (3)

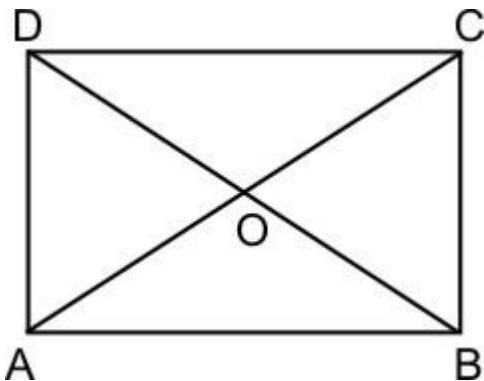Q 24 Two adjacent angles of a parallelogram are (3x − 4) and (3x + 10). Find the angles of the parallelogram.

Marks (3)

Q 25 ABCD is a rectangle with AB = 12 and BC = 5. Find AC.


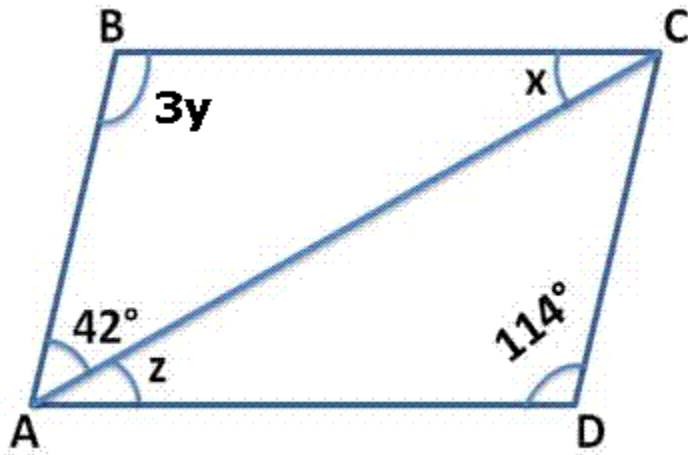
Marks (3)

Q 26 In the following figure, ABCD is a rectangle and its diagonals meet at O. Find x, if OA = 2x + 4 and OD = 3x + 1. Also find BD.



Marks (3)

Q 27 Find the values of x, y and z in a parallelogram ABCD shown in the figure given below.



Marks (4)

Q 28 Find x+y+z+w shown in the following figure:



Marks (4)

Q 29 Find the measure of angle x in the following figure:
(i)

(ii)



Marks (4)

Q 30 Find the measure of angle x in the following figure:
(i)
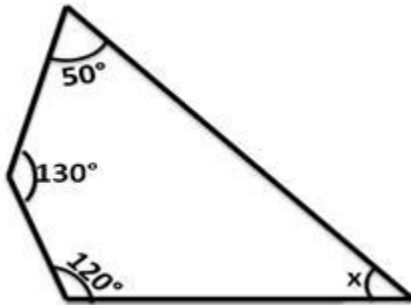


(ii)
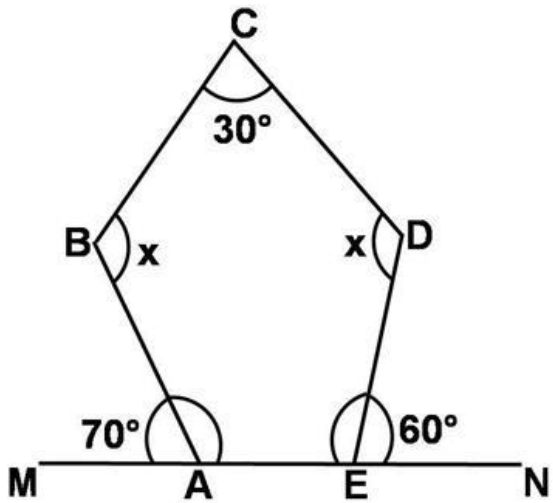


Marks (4)

Q 31 Find x + y + z shown in the following figure:
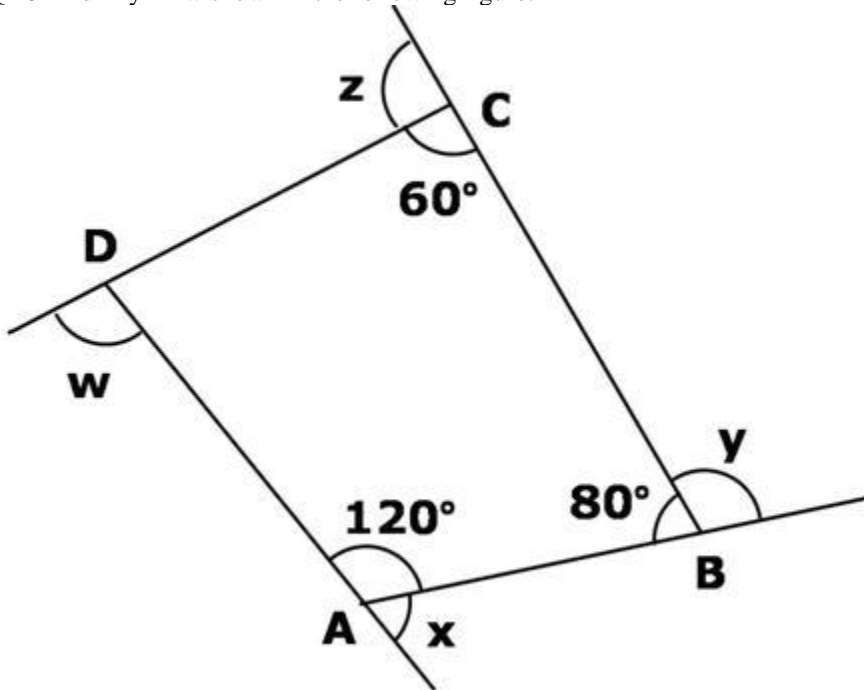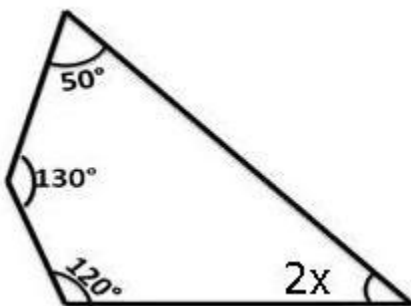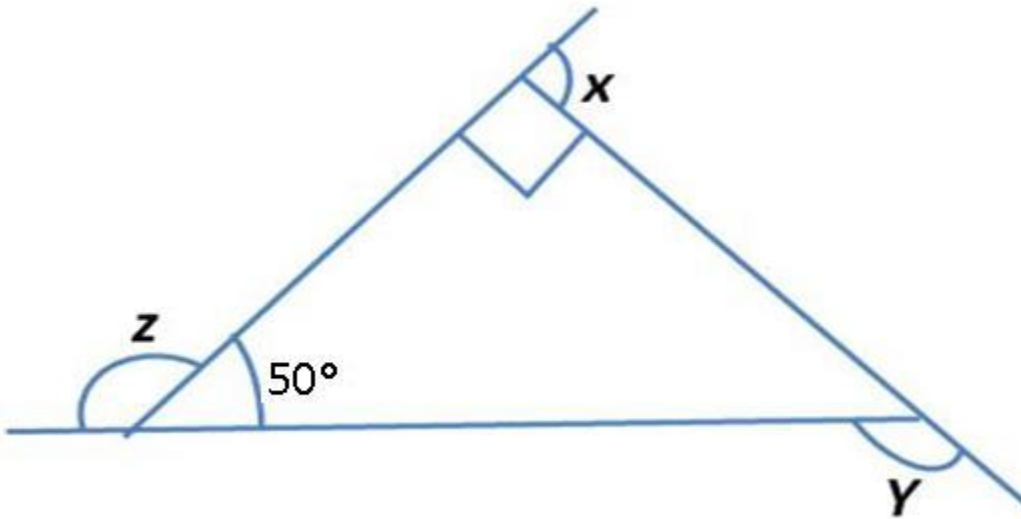


Marks (4)

Q 32 Find the values of x, y and z in a parallelogram ABCD shown in the figure given below.
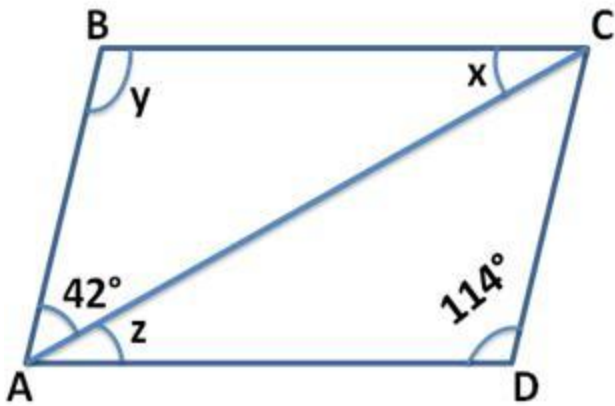


Marks (4)

Q 33 Find x+y+z+w shown in the following figure:
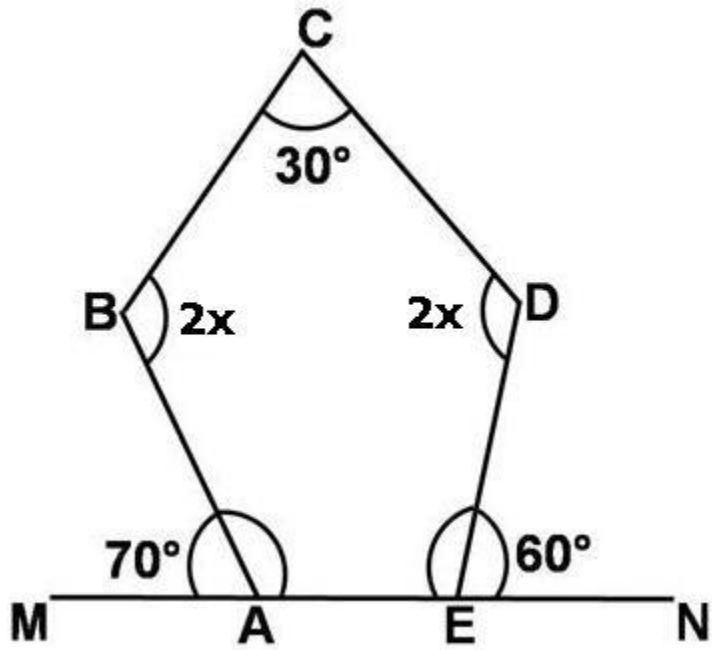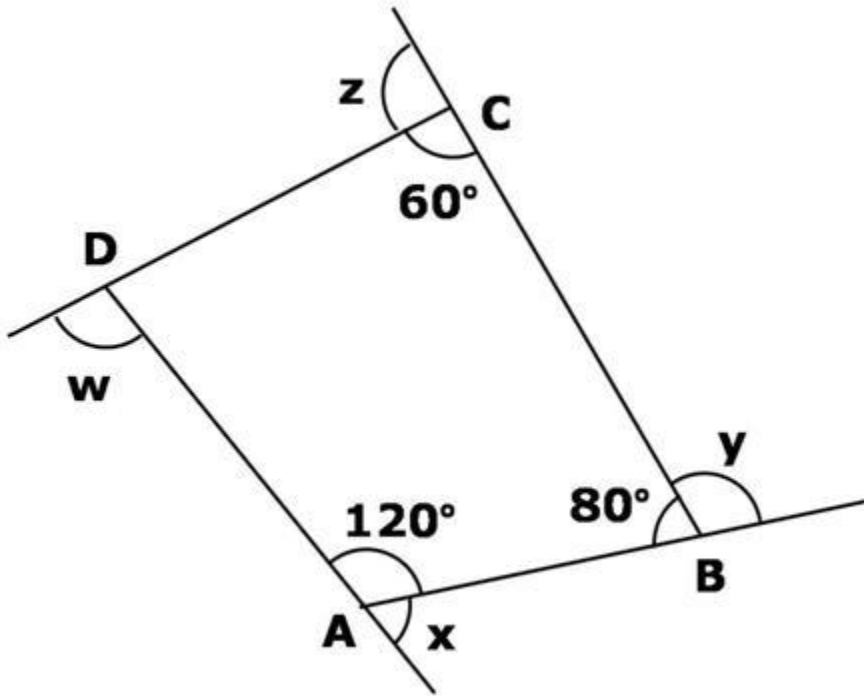


Marks (4)

Q 34 (i) In the figure given below, ABCD is a parallelogram. Find the value of x, y and z.
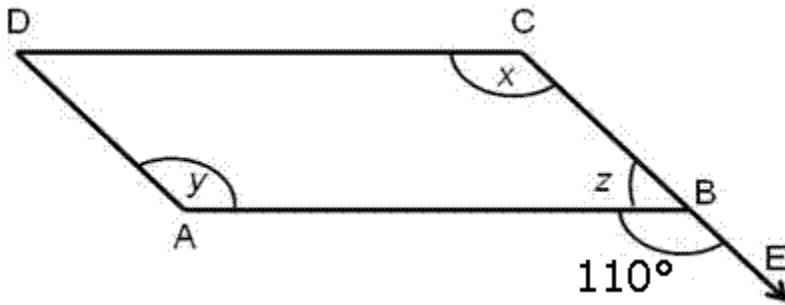


(ii) Figure HELP shown below is a parallelogram. It is given that OE=3 cm and HL is 7 more than PE, find OH.
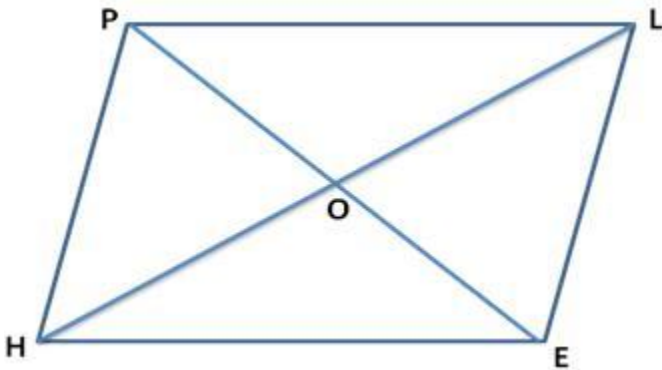


Marks (4)

Q 35 Find x + y + z shown in the following figure:
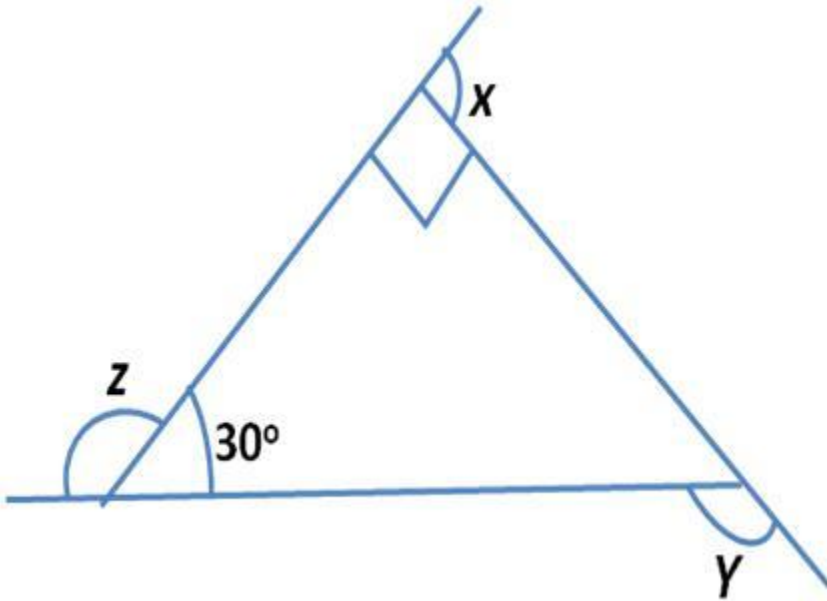


Marks (4)

Q 36 (i) In the figure given below, ABCD is a parallelogram. Find the value of x, y and z.
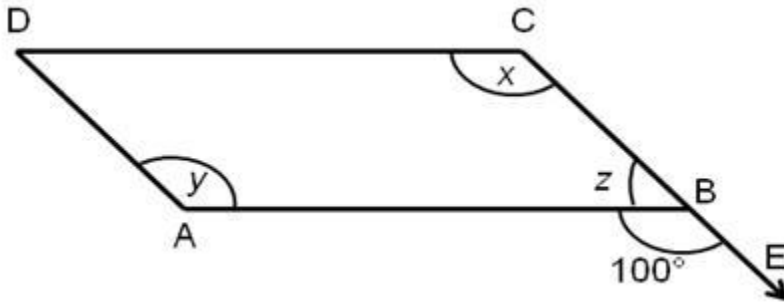


(i) Figure HELP shown below is a parallelogram. It is given that OE=4 cm and HL is 7 more than PE, find OH.
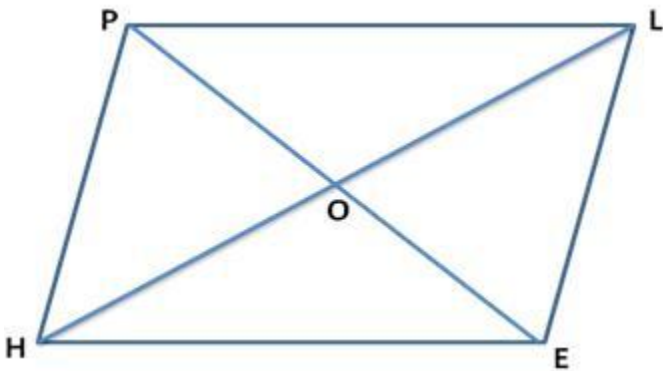


Marks (4)

Q 37 The lengths of the diagonals AC and BD of a rhombus are 6 cm and 8 cm respectively. Find the length of each side of the rhombus.
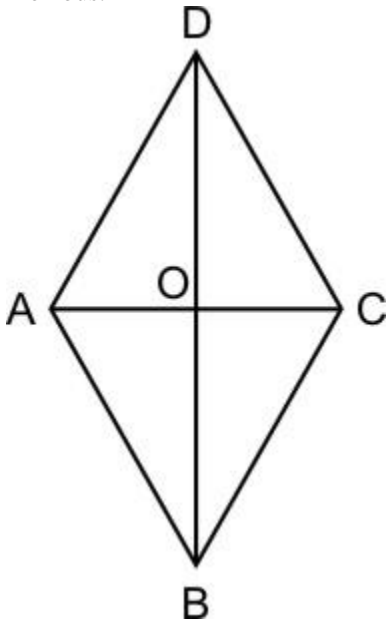


Marks (5)

## Most Important Questions

Q 1 What is the sum of all the angles of a 11-sided polygon?

Q 2 Five angles of a hexagon are 150° , 95°, 80°, 135° and 125°. Find the sixth angle.

Q 3 Find the measure of each angle of a regular pentagon.

Q 4 How many diagonals are there in a hexagon?

Q 5 How many diagonals are there in an octagon?

Q 6 If each interior angle of a regular polygon is 144°. Find the number of sides in it.

Q 7 An exterior angle and the interior angle of a regular polygon are in the ratio 2:7. Find the number of sides in the polygon?

Q 8 Find the sum of the interior angles of a polygon with 8 sides.

Q 9 Complete the following:

A quadrilateral has ………….. sides.

A quadrilateral has ………….. angles.

A quadrilateral has ………….. diagonals.

A quadrilateral has ………….. vertices.

Q 10 Can a polygon have the sum of its interior angles as:

(i)  2160°          (ii) 2400°

Q 11 The angle of a quadrilateral are in the ratio 3 : 4 : 5 : 6. Find all its angles.

Q 12 Three angle of a quadrilateral are in the ratio 4 : 6 : 3. If the fourth angle is 100°. Find the other three angles of the quadrilateral.

Q 13 In the given figure, ABCD is a rectangle. BM and DN are perpendicular to AC from B and D respectively.
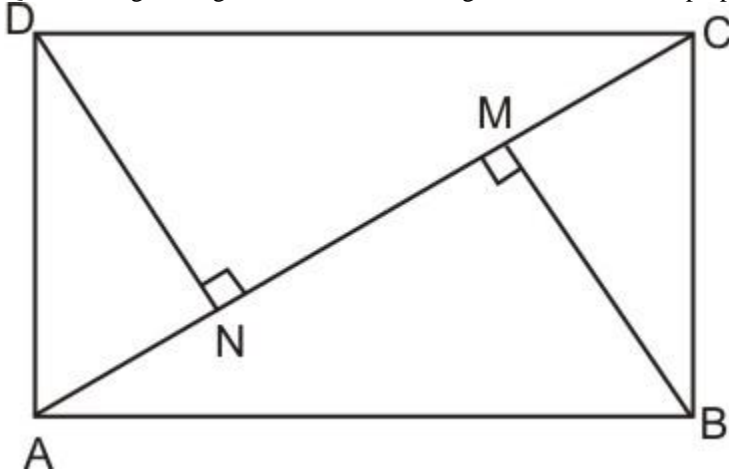


(i) AB = CD ? Why ?
(ii) Is ∠BMA = ∠DNC ? Why ?
(iii) Is ∠BAM = ∠DCN ? Why ?
(iv) Is △BMA ≅ △ DNC ? By which congruence condition?
(v) Is BM = DN ? Why ?

Q 14 In the given figure, diagonals AC and BD of a rectangle ABCD intersect each other at a point O. If OA = 4 cm, find AC and BD.
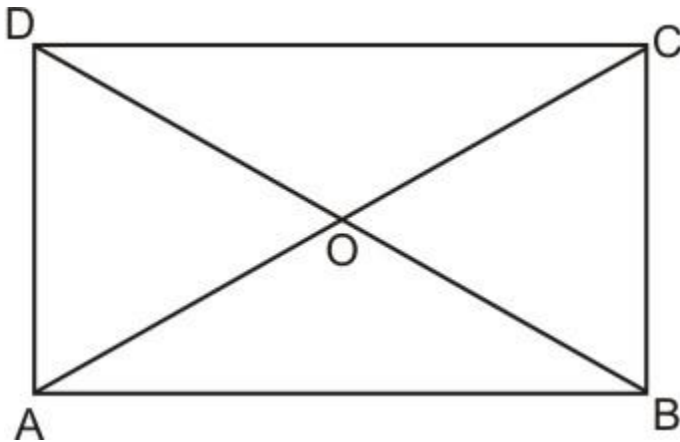


Q 15 In figure ABCD is parallelogram in which ∠DAB = $75^0$ and ∠DBC = $60^0$, calculate ∠CDB and ∠ADB.

Q 16 The diagonal of a Rhombus is 6cm and 8cm find the length of a side of rhombus.

Q 17 ABCD is a parallelogram. What special name will you give it if the following additional facts are known?
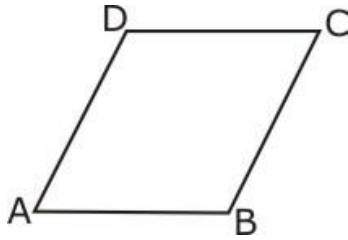


(i)           AB = AD

(ii)         DAB = $90^0$

(iii)       AB = AD and $\angle$DAB = $90^0$

Q 18 State, whether the given statement is true or not.

(i)       A rectangle is a parallelogram.

(ii)      A square is a rectangle.

(iii)     A rectangle is a rhombus.

(iv)     A square is a rhombus.

(v)      A rectangle is a square.

Q 19 Which of the following are true for a rhombus?

(i)       It has two pairs of parallel sides.

(ii)      It has two pairs of equal angles.

(iii)     It has only two pairs of equal sides.

(iv)     Two of its angles are right angle.

(v)      Its diagonals bisect each other at right angle.

(vi)     Its diagonals are equal and perpendicular to each other.

(vii)    It has all its sides of equal lengths.

Q 20 How does a trapezium differ from a parallelogram?

Q 21 How does a rhombus differ from a square?

Q 22 How does a kite differ from a parallelogram?

Q 23 Let ABCD be a parallelogram. What special name would you give it, when:

(a) AB = AD

(b) $\angle$ABC = $90^0$

(c)   AB = AD and $\angle$ABC = $90^0$

# 4. **Practical Geometry**

Q 1 Name the quadrilateral whose opposite sides are parallel.

Mark (1)

Q 2 Name the quadrilateral whose diagonals are equal and bisect each other at right angle.

Mark (1)

Q 3 Why do we call square as a regular quadrilateral?

Mark (1)

Q 4 Construct the quadrilateral ABCD in which AB = 5 cm, BC= 4 cm, $\angle A = 60°$, $\angle B = 105°$ and $\angle C = 105°$.

Marks (2)

Q 5 The adjacent sides SP and PQ of a parallelogram PQRS are 4 cm each. State the measure of all the sides. What is another name of this figure?

Marks (2)

Q 6 The ratio of two adjacent sides of a parallelogram is 4:5. If its perimeter is 72 cm, find its adjacent sides.

Marks (2)

Q 7 The park in a town is made in the form of a kite. Its perimeter is 90 metres and one side is 10m more than other side. What are the lengths of other sides?

Marks (2)

Q 8 Construct the trapezium ABCD in which AB $\parallel$ CD, AB = 8 cm, BC = 6 cm, CD = 4 cm and $\angle B = 60°$.

Marks (3)

Q 9 Construct the quadrilateral ABCD in which AB = 4.5 cm, BC = 5.5 cm, CD = 4 cm, AD = 6 cm and AC = 7 cm.

Marks (3)

Q 10 Construct the quadrilateral PQRS where PQ = 4 cm, QR = 6 cm, RS = 5 cm, PS = 5.5 cm and PR = 7 cm.

Marks (3)

Q 11

Construct Quadrilateral ABCD in which AB = 3.5 cm, BC = 4 cm, CD = 5cm, $\angle B = 45°$ and $\angle C = 150°$.

Marks (3)

Q 12 Construct the quadrilateral TRUE in which TR = 3.5 cm, RU = 3 cm, UE = 4 cm, $\angle R = 75°$ and $\angle U =120°$.

Marks (3)

Q 13 Construct the parallelogram ABCD with AB = 3.5 cm, BC = 4 cm and AC = 6.5 cm.

Marks (3)

Q 14 Construct a rhombus with side 4.5 cm and one diagonal 6 cm.

Marks (3)


Q 15 Construct the quadrilateral ABCD with AB = 4 cm, BC = 6 cm, CD = 5.5 cm, AD= 5 cm and AC = 8 cm.

Marks (3)


Q 16 Construct the quadrilateral HOPE with HO = 4.5 cm, OP = 4 cm, PE = 6.5 cm, EH = 3 cm and OE = 6.5 cm.

Marks (3)


Q 17 Construct the quadrilateral PQRS in which PQ = 4 cm, QR = 3 cm, PS = 2.5 cm, PR = 4.5 cm and QS = 4 cm.

Marks (3)


Q 18 ABCD is a trapezium with AB∥CD, and $\angle$A=50° and $\angle$B = 50°. Prove that
(i) BC = DA
(ii) $\angle$C = $\angle$D and find the measurement of $\angle$C.

Marks (4)


Q 19 The perimeter of a parallelogram is 140 cm. If one of the sides is greater than the other by 20 cm, find the lengths of all the sides of the parallelogram.

Marks (4)


Q 20 ABCD is a trapezium in which AB∥DC and AD =
BC. If CE is drawn parallel to AD, meeting AB at
E, prove the following:
(i)   AECD is a parallelogram.
(ii)  AD = EC
(iii) ☐CEB is an isosceles triangle.




Marks (4)


Q 21 Construct the square READ with RE = 5.1 cm.

Marks (5)


Q 22 Construct a rhombus ABCD where AC = 5.2 cm and BD = 6.4 cm.

Marks (5)


Q 23 Construct a rectangle ABCD with AB = 5 cm and BC = 4 cm.

Marks (5)


Q 24 Construct a quadrilateral ABCD in which AB = 6 cm, BC = 5 cm, $\angle$A = 55°, $\angle$B= 110° and $\angle$D = 90°.

Marks (5)


Most Important Questions


Q 1 Is it possible to construct a quadrilateral ABCD in which AB = 3cm, CD = 3cm, DA = 7.5cm, AC = 8cm and BD = 4cm? If not, give reason.

Q 2 Is it possible to construct a quadrilateral ABCD in which AB = 5cm, BC = 7.5cm, $\angle$A = 80°, $\angle$B = 140°, $\angle$C = 145°? If not, give reason.

Q 3 Construct a quadrilateral ABCD in which AB=4.4cm,BC=4cm,CD=6.4cm,DA=2.8cm and    BD=6.6cm.?

Q 4 Construct a parallelogram ABCD where AB=3.6cm,BC=4.2cm and AC=6.5cm.?

Q 5 Construct a rhombus with side 4.5cm and one diagonal 6cm.

Q 6 Construct a quadrilateral ABCD in which AB = 5cm, BC = 4cm, AD = 3cm, CD = 6cm and BD = 5cm.

Q 7 Construct a quadrilateral ABCD in which AB = BC = 3cm, AD = 5cm, A = 90° and B = 105°.

Q 8 Construct a rectangle with sides 4.5cm and 6cm.

Q 9 Construct a quadrilateral ABCD in which AB = 7cm, AD = 6cm, AC = 7cm, BD = 7.5cm and BC = 5cm.

Q 10 Construct a quadrilateral ABCD in which AB = 5.5 cm,AD = 4.4 cm,CD = 6.5 cm,AC = 6.5 cm and BD = 7.1 cm.?

Q 11 Construct a quadrilateral ABCD in which AB=5.4cm,BC=2.5cm,CD=4cm,AC=6.5cm and BD=5cm.?

Q 12 Construct a quadrilateral ABCD in which AB = 6 cm, BC = 5 cm, $\angle$A = 55°, $\angle$B = 110° and $\angle$D = 90°.

Q 13  Construct a quadrilateral PQRS in which $\angle$Q = 45°, $\angle$R = 90°,
 QR = 5cm, PQ = 4cm and RS = 3 cm.

Q 14 Construct a quadrilateral ABCD in which AB=3.6cm, BC=5.5cm, CD=5cm, angle B=125 and angle C=80?

Q 15 Construct a quadrilateral ABCD in which AB=5.1cm,AD=4cm,BC=2.5cm, angle A=60 and angle B =85?

Q 16 Construct a quadrilateral ABCD in which AB=3.5cm,BC=6.5cm, $\angle$ A=75° and $\angle$B=105° and $\angle$ C=120°?

Q 17 Construct a quadrilateral ABCD in which AB=5.3 cm,AD = 2.9 cm, $\angle$ A=70° and $\angle$B = 95° and $\angle$C = 85° ?

Q 18 Construct a quadrilateral in which QR = 7.5 cm, RP = PS = 6 cm, RS = 5 cm and QS = 10 cm.

Q 19 Construct a trapezium ABCD in which AB $\parallel$ CD, AB = 8 cm, BC = 6.0 cm and CD = 4 cm and $\angle$B = 60°.

Q 20 Construct a parallelogram whose two sides and one angle are 4 cm, 5.5 cm and 70° respectively.

# 5. Data Handling

Q 1 Define raw data.

Mark (1)

Q 2 Define frequency.

Mark (1)

Q 3 Define width or size of the class interval.

Mark (1)

Q 4 Define upper class limit and lower class limit.

Mark (1)

Q 5 What is a circle graph or pie chart?

Mark (1)

Q 6 Define an event.

Mark (1)

Q 7 What is the probability of an event?

Mark (1)

Q 8 In an experiment of tossing a coin once, what is the probability of getting a head?

Mark (1)

Q 9 If a die marked with 1, 2, 3, 4, 5, 6 on its faces is thrown, what is the probability of getting the number 3?

Mark (1)

Q 10
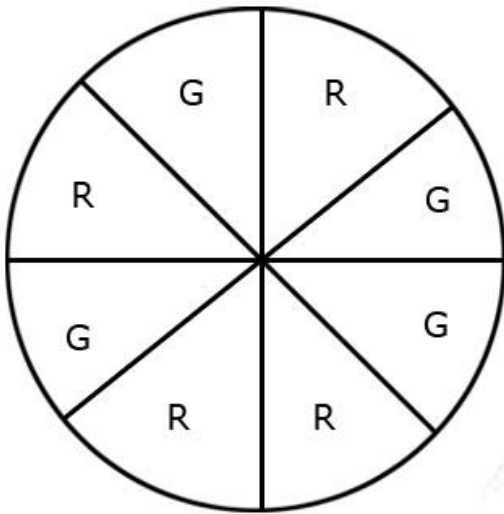


On spinning the wheel,

(i) what will be the probability of getting a green (G) sector?
(ii) what will be the probability of not getting a green (G) sector?

Marks (2)

Q 11 A bag has 10 red marbles and 6 blue marbles. A marble is drawn from the bag without looking into the bag. What is the probability of getting a blue marble?

Marks (2)

Q 12 A bag has 4 red balls and 6 yellow balls. A ball is drawn from the bag without looking into the bag. Find the probability of getting a red ball.

Marks (2)

Q 13 Define random experiment.

Marks (2)

Q 14

| Subject | Number of students |
|---------|---------------------|
| Art | 7 |
| Maths | 8 |
| Science | 6 |
| English | 5 |

Answer the following question from the table given above.

1. Which is the most liked subject?
2. Which is the least liked subject?

Marks (2)

Q 15
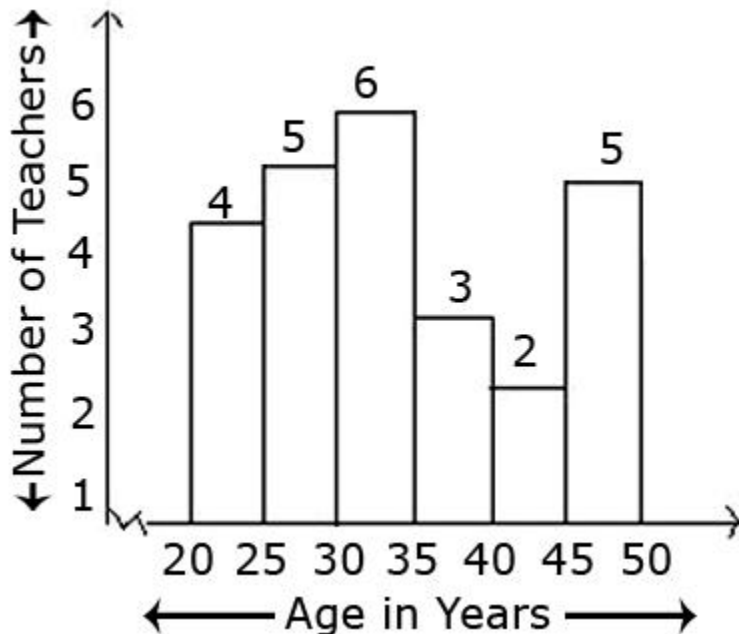


Answer the following questions from the above histogram.

1.  How many teachers are of age 45 years or more but less than 50 years?
2.  How many teachers are of age less than 35 years?

Marks (2)

Q 16 Frequency distribution of income of 20 workers

Class interval　　　　　Frequency (No. of Workers)

(Daily income in Rs)

| 100 – 125 | 5 |
| 125 – 150 | 6 |
| 150 – 200 | 4 |
| 200 – 250 | 3 |
| 250 – 300 | 2 |

Answer the following questions from the frequency table.

1) What is the class size of the class interval?

2) Which class has the highest frequency?

3) Which class has the lowest frequency?

4)  Which class has 3 as its frequency?

Marks (2)

Q 17 Make a discrete frequency distribution table for the given ages of 25 students of class VIII.

15, 16, 16, 14, 17, 17, 16, 15, 15, 16, 16, 17, 15, 16, 16, 14, 16, 15, 14, 15, 16, 16, 15, 14, 15

Marks (2)

Q 18 The following pie chart shows the times spent by a child during a day.



Answer the following questions based on the given pie chart.

1. What proportion of the sector for hours is spent in sleeping?
2. What proportion of the sector for hours is spent in school?

Marks (2)

Q 19 Draw a pie chart for the following data:

| Flavours | Percentage of students preferring the flavours |
|---|---|
| Chocolate | 25% |
| Strawberry | 25% |
| Vanilla | 50% |

Marks (2)

Q 20 List the outcomes of tossing two coins together.

Marks (2)

Q 21 A card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is a black king.

Marks (3)

Q 22 The marks scored by 20 students in a test are given below:
54, 42, 68, 56, 62, 71, 78, 51, 72, 53, 44, 58, 47, 64, 41, 57, 89, 53, 84, 57

(i)  Complete the following frequency table.

| Marks as class intervals | Tally marks | Frequency (no. of students) |
|---|---|---|
| 40 – 50 | | |
| 50 – 60 | | |
| 60 – 70 | | |
| 70 – 80 | | |
| 80 – 90 | | |

(ii)  In which class interval the greatest frequency occurs?

Marks (3)

Q 23 When a die is thrown, list the outcomes of an event of getting

(i)  a prime number.
(ii) a number greater than 5.
(iii) a composite number.

Marks (3)

Q 24 A bag contains 3 red and 2 blue marbles. A marble is drawn at random. What is the probability of drawing a blue marble?

Marks (3)

Q 25 Draw a histogram for the following data:

| Class Interval | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 | 40-45 | 45-50 | 50-55 | 55-60 |
|---|---|---|---|---|---|---|---|---|---|---|
| Frequency | 30 | 20 | 10 | 90 | 50 | 10 | 30 | 10 | 10 | 40 |

Marks (3)

Q 26 The following pie chart gives the expenditure (in percentage) on various items and savings of a family during a month.

Home Rent
10%

Education per
children 15%

Transport
5%

Others 20%

Food 25%

Savings 15%
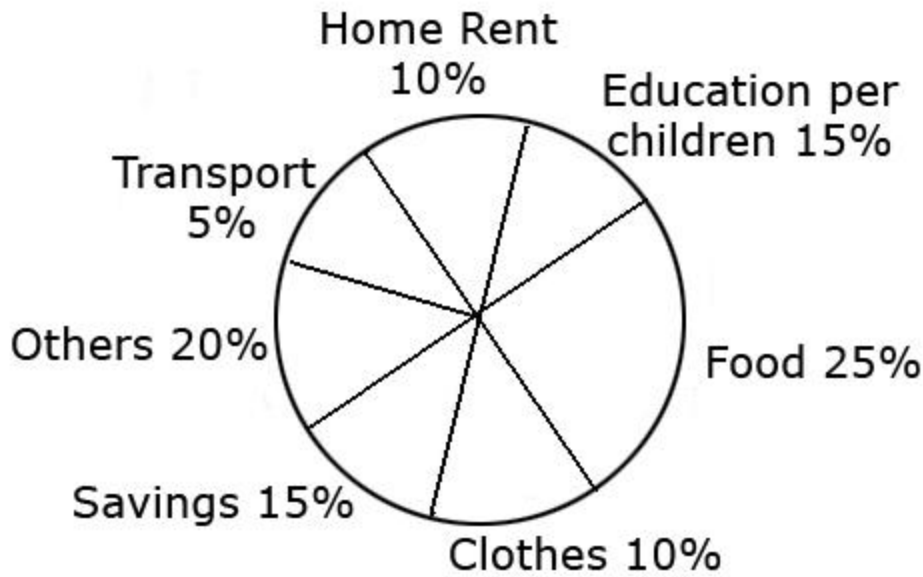
Clothes 10%

(1) On which item the expenditure is minimum?

(2) Expenditure on which item is equal to the total savings of the family?

(3) If the monthly savings is Rs 4500, what is the monthly expenditure on clothes?

Marks (3)

Q 27 One card is drawn from a pack of 52 cards, each of the 52 cards are equally likely to be drawn. Find the probability that the card drawn is

(i)  an ace.
(ii) a face card.
(iii) red.
(iv)  2 of spades.

Marks (4)

Q 28 The number of apples collected from 50 trees is recorded below:
35, 67, 24, 111, 78, 45,  38, 52,15, 25, 73, 84, 65, 18, 82, 63, 78, 142, 23, 69,  32, 56, 12, 15, 55, 98, 71, 12,   9, 62, 6, 138, 102, 123, 46, 89, 110, 128, 48, 19, 53, 85, 70, 112, 148, 133, 63, 80, 98, 96.
Make a group frequency table and represent the data by using a histogram.

Marks (4)

Q 29 When a die is thrown, list the outcomes of an event of getting a
(a) composite number.
(b) non-composite number.
(c) number greater than 4.
(d) number not greater than 3.

Marks (4)

Q 30 Numbers 1 to 20 are written on twenty separate slips (one number on one slip) kept in a box and mixed well. One slip is chosen from the box without looking into it. What is the probability of getting
(i) number 7?
(ii) a number less than 15?
(iii) a number greater than 8?
(iv) a 2-digit number?

                                                    Marks (4)


Q 31 Numbers 1 to 10 are written on ten separate slips (one number  on one slip), kept in a box and mixed well. One slip is chosen from the box without looking into it. What is the probability of

(i) getting a number 6?
(ii) getting a number less than 7?
(iii)  getting a number greater than 8?
(iv) getting a one-digit number?
(v) getting a two-digit number?

                                                    Marks (5)


| Most Important Questions |
| --- |

Q 1 Define raw Data ?


Q 2 The colour of refrigerators preferred by people living in a locality are shown by the following pictograph:
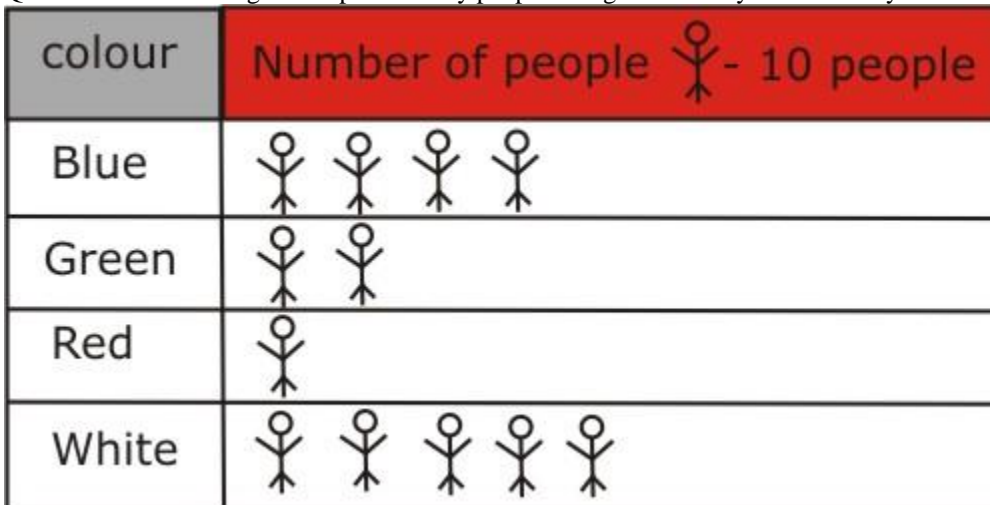


 (a)    Find the number of people preferring blue colour.
( b)   How many people like white colour.


Q 3 A survey was carried out on 17 students of class VIII in a school . Data about the different modes of transport used by them to travel to the school is displayed as pictograph. What can you conclude from the pictograph?

| Modes of travelling | Number of students | ☺ - student |
|---|---|---|
| Private car | ☺ ☺ ☺ ☺ | |
| Public bus | ☺ ☺ ☺ ☺ ☺ | |
| School bus | ☺ ☺ ☺ ☺ ☺ ☺ ☺ ☺ | |

Q 4 The following are the number of electric bulbs purchased for a lodging house during the first four months of a year. Represent the details by a pictograph.

| Months | Number of bulbs |
|---|---|
| January | 20 |
| February | 26 |
| March | 30 |
| April | 34 |

Q 5 The number of Mathematics books sold by a shopkeeper on four consecutive days is shown below:

| Days | Sunday | Monday | Tuesday | Wednesday | Thursday |
|---|---|---|---|---|---|
| Number of books Sold | 48 | 40 | 30 | 50 | 20 |

Q 6

Read the above bar graph and give answer of the following questions:
( a) What is the total number of books sold in all days?
( b) On which day the maximum number of books are sold ?

Q 7 The following data gives the amount of loans ( in crores of rupees) given out by a bank during five years :

| Year | Loans ( in crores of rupees) |
|------|------------------------------|
| 1995 | 20 |
| 1996 | 25 |
| 1997 | 40 |
| 1998 | 35 |
| 1999 | 50 |

Construct a bar graph representing the above information.
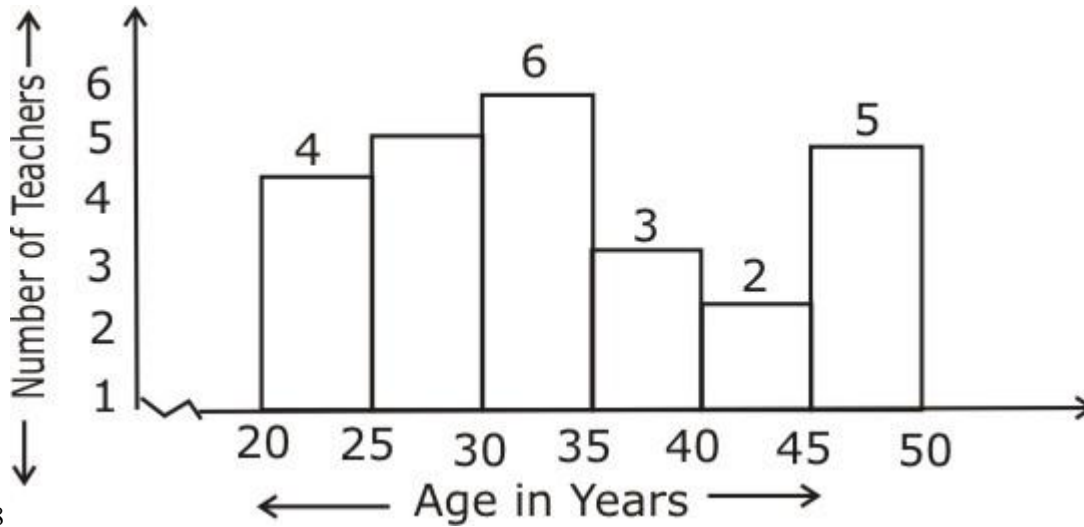


Q 8
Answer the following from the above figure.
1. How many teachers are of age 45 yrs or more but less than 50 years?
2. How many teachers are of age less than 35 years?

Q 9 Bar graph given below shows the amount of wheat purchased by government during the Year 1998-2002.

Bar graph given below shows the amount of wheat purchased by government during the Read the bar graph and write down your observations.
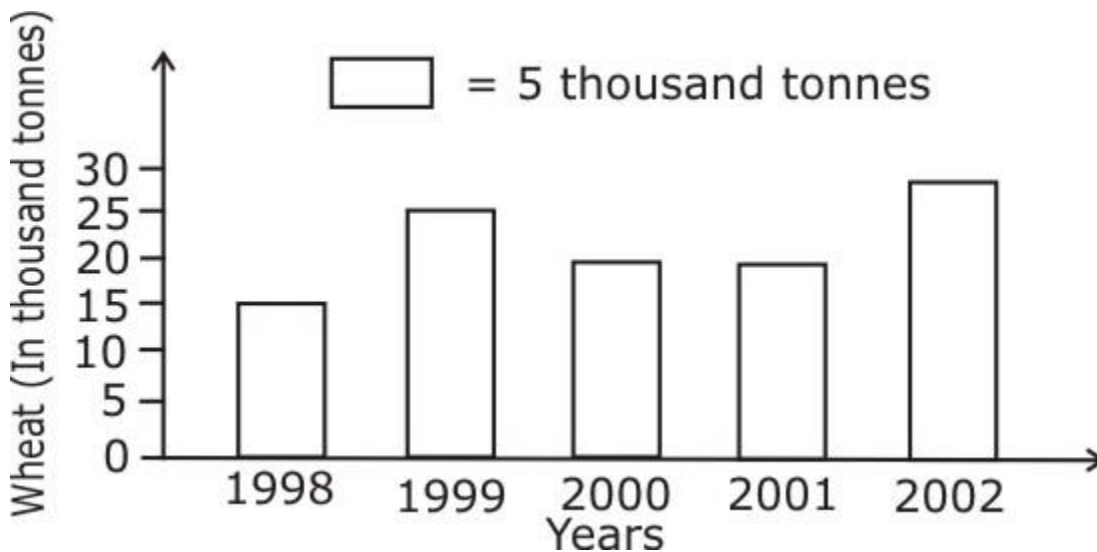


(a) In which year the maximum amount of wheat was purchased ?
(b) In which year the minimum amount of wheat was purchased minimum?

Q 10 The following data represents the Marks obtained by a student in 2003 and 2004. Draw a double bar Graph.

| Subject | Math | Science | English | Hindi |
|---------|------|---------|---------|-------|
| 2003 | 30 | 50 | 55 | 50 |
| 2004 | 60 | 60 | 45 | 50 |

Q 11 Read above double bar graph and give the Answer of following questions:
(a) In which subject the performance of student improve?
(b) In which subject the performance of student deteriorated?
Q 12 Define frequency?

Q 13

| Subject | Tally | Number of students |
|---------|-------|---------------------|
| Art | ⅢⅢ II | 7 |
| Math | IIII | 4 |
| Science | ⅢⅢ I | 6 |
| English | ⅢⅢ | 5 |

What does the friquency table represent ?
What the frequency of students who like English?
What the frequency of students who like Math?

Q 14 Make discrete frequency distribution table for the ages of 25 students of class VIII.
15, 16, 16, 14, 17, 17, 16, 15, 15, 16, 16, 17, 15, 16, 16, 14, 16, 15, 14, 15, 16, 16, 15, 14, 15
Q 15 Define width or size of the class.

Q 16 In Mathematics following marks were obtained by 25 students. Arrange
these marks in a table using tally marks.
21,10,30,22,33,5,37,12,25,40,18,13,27,28,19 12,3,24,38,21,33,7,17,22,40
Q 17 Frequency distribution table is given for income of 20 workers. Give answer of the following questions.

| Class interval (Daily income in Rs.) | Frequency (No. of Workers) |
|--------------------------------------|----------------------------|
| 100 – 125 | 5 |
| 125 – 150 | 6 |
| 150 – 200 | 4 |
| 200 – 250 | 3 |
| 250 – 300 | 2 |

Answer the following from the frequency table.
(1) What is the class size of the class interval?

(2) Which class has highest frequency?
(3) Which class has lowest frequency?
(4) Which class has 3 as its frequency?

Q 18 Study the following frequency distribution table and answer the questions given below. Frequency Distribution of daily income of 530 workers of a factory.

| Class Interval (Daily Income in rupees) | Frequency (Number of workers) |
|---|---|
| 100 -125 | 45 |
| 125 – 150 | 25 |
| 150 – 175 | 55 |
| 175 - 200 | 125 |
| 200 – 225 | 140 |
| 225 - 250 | 55 |
| 250 - 275 | 35 |
| 275 - 300 | 50 |
| Total | 530 |

(i) What is the size of class interval?
(ii) Which class has the highest frequency?
(iii) Which class has the lowest frequency?
(iv) What is the upper limit of the class interval 250 - 275?
(v) Which two classes have the same frequency?

Q 19 Construct a frequency distribution table for the data on weight (in Kg) of 20 students of a class using intervals 30-35, 35-40 and so on.
40,38,33,48,60,53,31,46,34,36,49,65,42,44,47,38,39.

Q 20 The marks scored by 20 students in a test are given below as 54, 42, 68, 56, 62, 71, 78, 51, 72, 53, 44, 58, 47, 64, 41, 57, 89, 53, 84, 57.
Complete the following frequency table.

| Marks in class intervals | Tally marks | Frequency (no. of children) |
|---|---|---|
| 40 – 50 | | |
| 50 – 60 | | |
| 60 – 70 | | |
| 70 – 80 | | |
| 80 – 90 | | |

What is the class interval in which the greatest frequency occurs?

Q 21 Following marks (out of 50) obtained in Hindi by 20 students of class VIII. Arrange these marks in distribution table with tally marks.
36,33,18,20,38,22,44,16,5,10,1,39,41,20,31,11 35, 17,6,1

Q 22 Define Histogram?

Q 23 The following graph is histogram, give answers of the following questions:
(i) How many teachers are of age 30 years or more but less than 35 years?

(ii) How many teachers are of age less than 25 Years?
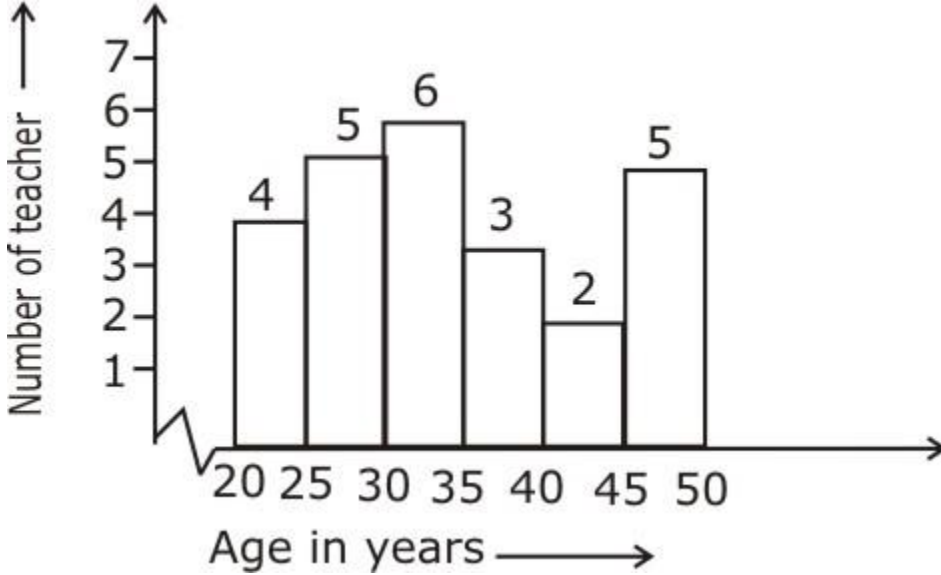


Q 24 The weekly wages (in Rs) of 20 workers in a factory are.
830,835,890,810,835,836,869,845,898,890,820,860,832,833, 855,845,804,808,812,840
Make a frequency table with intervals as 800-810,810-820 and So on.

Q 25 Draw a histogram for the above frequency table.

Q 26 Observe the above histogram and give the answer of following questions:
How many workers earn less than Rs 850?
Which group contains maximum numbers of workers?
How many workers earn Rs 850 and more?

Q 27 What is circle graph or pie chart.

Q 28 The favorite flavors of ice- creams for students of a school is given in percentages as follows. Represent this data in pie chart.

| Flavors | Percentage of students Preferring the flavors |
|---|---|
| Chocolate | 50% |
| Vanilla | 25% |
| Other flavors | 25% |

Q 29 On a particular day , the sales ( in rupees ) of different items of a
Baker's shop is given below.
Ordinary bread     : 320
Fruit bread         :  80
Cakes and pastries : 160
Biscuits            : 120
Others              :  40
    Total           : 720

Draw a pie chart for the given above information.

Q 30 The adjoining pie chart gives the marks scored in an examination by a student in Hindi, English, Mathematics, Social science and science. If the total marks obtained by the students were 540, answer the following questions:
(a) In which subject did the student score 105 marks?
(b) How many more marks did the student in Mathematics than in Hindi obtain?
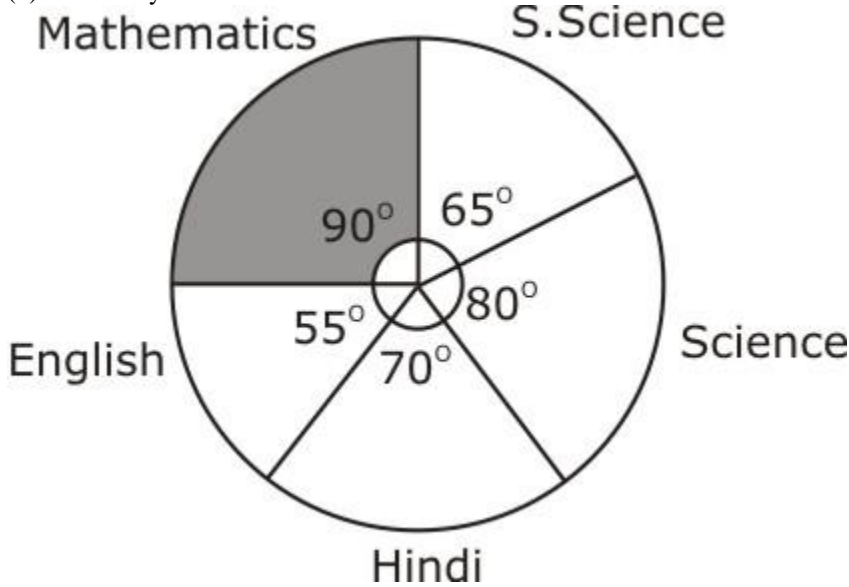


Q 31 The number of students in a hostel, speaking different languages is given below. Display the data in a pie chart.

| Language | Hindi | English | Marathi | Total |
|---|---|---|---|---|
| Number of students | 50 | 15 | 7 | 72 |

Q 32 What is the probability of an event?
Q 33 A bag has 3 red balls and 2 yellow balls. A ball is drawn from the bag without looking into the bag. What is the probability of getting a yellow ball?
Q 34 In the experiment of tossing a coin once, what is the probability of getting a head?
Q 35 In tossing two coins together, list the outcomes.
Q 36 A card is drawn at random from a pack of 52 cards. Find the probability that the card drawn is a black king.
Q 37 From a well shuffled pack of 52 cards; a card is drawn at random. Find the probability that it is an ace of red colour?
Q 38 If you have a spinning wheel with 3 green sectors, 1 blue sector and 1 red sector, what is the probability of getting a green sector?

# 6. Squares and Square Roots

Q 1 Find the square root of 729.

Q 2 Fill in the blank using the given pattern.

$7^2 = 49$

$67^2 = 4489$

$667^2 = 444889$

$6667^2 = $ _____

Q 3 Without adding find the sum of $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17$.

Q 4 Express $19^2$ as sum of two consecutive integers

Q 5 How many numbers lie between squares of 99 and 100?

Q 6 Find the square of 35 (without actual multiplication).

Q 7 Fill in the blank:

$$\sqrt{28} = 2 \times \square$$

Mark (1)

Q 8 Find the square root of 1764.

Mark (1)

Q 9 Find the number of digits in the square root of 390625.

Mark (1)

Q 10 Find the square root of 1296.

Marks (2)

Q 11 Find the square root of 3136 by division method.

Marks (2)

Q 12 The area of a square plot is 4489 m$^2$. Find the side of the square plot.

Marks (2)

Q 13 Find the square root of 7.29.

Marks (2)

Q 14 Find the greatest 4-digit number which is a perfect square.

Marks (2)

Q 15 Find the side of a square whose area is 1024 m².

Marks (2)

Q 16 Find the value of x that makes the following statement correct.

$$\sqrt{8x} \times \sqrt{2x} = 144$$

Marks (2)

Q 17 Find $37^2$ using the identity $(a + b)^2 = a^2 + 2ab + b^2$.

Marks (2)

Q 18 Find the square root of $\dfrac{225}{3136}$

Marks (2)

Q 19 Find the square root of 31.36.

Marks (2)

Q 20 Find the square root of 8100.

Marks (2)

Q 21 Find the square root of 36 by successive subtraction.

Marks (2)

Q 22 Find the smallest square number which is divisible by each of the numbers 4, 9 and 10.

Marks (3)

Q 23 2025 students are made to stand in a field in such a way that each row contains as many students as the number of rows. Find the number of rows and the number of students in each row.

Marks (3)

Q 24 Find the square root of 2 correct to two places of decimal.

Marks (3)

Q 25 Find the square root of 363609.

Marks (3)

Q 26 Find the least number that must be added to 893304 to obtain a perfect square.

Marks (3)

Q 27 A society collected Rs 2401. Each member collected as many rupees as there were members. How many members were there and how much did each contribute?

Marks (4)

Q 28 Find the square root of 11.666667 or 35/3 correct up to two places of decimal.

Marks (4)

Q 29 Find the square root of 2.9 correct up to two places of decimal.

Marks (4)

Q 30 Find the square root of 2 correct up to two places of decimal.

Marks (4)

Q 31 Find the square root of 2.9 correct up to two places of decimal.

Marks (4)

Q 32 Find the square root of 3 correct up to two places of decimal.

Marks (4)

Q 33 Find the square root of 0.9 correct up to three places of decimal.

Marks (4)

Most Important Questions

Q 1 Determine whether a square of the 21 is even or odd.

Q 2 Determine whether a square of the 38 is even or odd.

Q 3 The sum of two square numbers is a square number.

Q 4 The product of two square numbers is a square number.

Q 5 $\sqrt{0.36} = 0.06$, it is true.

Q 6 Why the number 1053 is not perfect squares?

Q 7 What will be the unit digit in the square of 23?

Q 8 Determine whether the square of the 213 is even or odd.

Q 9 If $115^2 = 11 \times (11 + 1)$ hundred $+ 25 = 13225$, then the value of $205^2$ is
(a)    202025      (b)    40225        (c)    42025        (d)    42205

Q 10 Find the square of 405 using the identity $(a + b)^2 = a^2 + 2ab + b^2$.

Q 11 Find the square of 395 using the identity $(a - b)^2 = a^2 - 2ab + b^2$.

Q 12 The smallest natural number which when added to the difference of squares of 17 and 13 gives a perfect square is
(a)    1      (b)    5      (c)    11      (d)    24

Q 13 If a square number ends in 6, the preceding figure is
(a)    An even number          (b)    an odd number
(c)    A prime                        (d)    a composite number

Q 14 Why 7928 is not perfect squares?

Q 15 What will be the unit digit of the squares of the 3853?

Q 16 Find the value of $\sqrt{156.25}$ x $\sqrt{1.5625}$.

Q 17 A decimal fraction is multiplied by itself. If the product is 251953.8025, find the fraction.

Q 18 Find the square root of $\sqrt{2}$ correct to three places of decimals.

Q 19 Find the square root of 121 by the method of repeated subtraction.

Q 20 Using the division method, find the square root of 363609.

Q 21 A General wishing to arrange his men, who were 335250 in number in the form of a square that were 9 men left over. How many were there in each row?

Q 22 Area of square field is 8216.36m². The perimeter of square field is
(a)    362.57 m    (b)    336.28 m    (c)    268.29 m    (d)    242.57 m

Q 23　Find the value of $\dfrac{\sqrt{3249}-\sqrt{2209}}{\sqrt{361}-\sqrt{81}}$.

Q 24 (a) 0.75　　　　　(b) 0.45
　　(c) 0.95　　　　　(d) 0.99

Q 25　If $\sqrt{1+\dfrac{27}{169}}=1+\dfrac{X}{13}$, then x =

(a) 0　　　　　　　　　(b) 1
(c) Cannot be determined　　　　(d) none of these

Q 26 Find the least number of six digits, which is a perfect square.

Q 27 Find the smallest number by which 1100 must be multiplied so that the product becomes a perfect square. Also, find the square root of the perfect square.

Q 28 Given 2 = 1.414, evaluate $\sqrt{}$ (625/98).

Q 29 Find the value of $\sqrt{}$ (11025 X 1024).

# 7. Cubes and Cube Roots

Q 1 Find the cube of 18.

Mark (1)

Q 2  Express $6^3$ as the sum of odd numbers using the pattern given below.

$$1 = 1 = 1^3$$

$$3 + 5 = 8 = 2^3$$

$$7 + 9 + 11 = 27 = 3^3$$

$$13 + 15 + 17 + 19 = 64 = 4^3$$

$$21 + 23 + 25 + 27 + 29 = 125 = 5^3$$

Mark (1)

Q 3  Show that 189 is not a perfect cube.

Mark (1)

Q 4 Find the number whose cube is 9261.

Mark (1)

Q 5 Find the cube root of 512.

Mark (1)

Q 6 Evaluate: $(0.8)^3$

Mark (1)

Q 7

Find the cube of $1\frac{2}{3}$.

Mark (1)

Q 8 Evaluate : $\sqrt[3]{4^3 \times 6^3}$

Mark (1)

Q 9 Find the one's digit of the cube of each of the following:

(a) 1024
(b) 71

Marks (2)

Q 10 Find the smallest number by which 12500 must be multiplied so that the product is a perfect cube.

Marks (2)

Q 11 Find the smallest number by which 704 must be divided to obtain a perfect cube.

Marks (2)

Q 12 Find the cube root of $140 \times 2450$.

Marks (2)

Q 13

Find the cube root of $\dfrac{125}{512}$

Marks (2)

Q 14 Find the cube root of 10648 by prime factorisation method.

Marks (2)

Find the cube of $5\dfrac{2}{7}$.

Q 15

Marks (2)

Q 16 Find the cube root of 1.331.

Marks (2)

Q 17

Evaluate: $\sqrt[3]{8 \times 17 \times 17 \times 17}$

Marks (2)

Q 18 Find the cube root of $27 \times 1728$.

Marks (2)

Q 19 Find the cube root of 5832.

Marks (2)

Q 20 Find the cube root of 91125.

Marks (2)

Q 21

Evaluate : $\sqrt[3]{125 \times 27}$

Marks (2)

Q 22

Evaluate:

$\sqrt[3]{700 \times 2 \times 49 \times 5}$

Marks (2)

Q 23 Find the cube root of 32768 through estimation.

Marks (3)

Q 24 Find the smallest number by which 1600 must be divided so that the quotient is a perfect cube, further find its cube root.

Marks (3)

Q 25 Sheetal makes a cuboid of sides 5 cm, 2 cm and 5 cm. How many such cuboids will she need to form a cube?

Marks (3)

Q 26 Find the cube root of the following by prime factorisation.
(i) 8000

(ii) 13824

Marks (4)

Q 27 Find the smallest number which when multiplied with 3600 will make the product a perfect cube. Further find the cube root of the product.

Marks (4)

Q 28 The three numbers are in the ratio 2 : 3 : 4. The sum of their cubes is 33957. Find the numbers.

Marks (4)

Q 29 The volume of a cube is 9261000 m$^3$. Find the side of the cube.

Marks (4)

Q 30 Find the cube root of the following by prime factorisation.
(i) 8000
(ii) 13824

Marks (4)

| Most Important Questions |

Q 1

Find the cubes of the following numbers:
(a) 5            (b) 13
(c) 50          (d) 120

Q 2

The smallest number by which 120393 must divided, so that the quotient is a perfect cube
(a) 7               (b) 12
(c) 13               (d) 3

Q 3

Which of the following is the cube of an odd natural number:
(a) 32678          (b) 4096
(c) 6859           (d) 1728

Q 4

Which of the following are the cubes of even natural numbers?
(a)    729    (b)    3375
(c)    1331   (d)    13824

Q 5 Match the items in list A with suitable items in list B.

List A               List B

A. $\sqrt[3]{\dfrac{27}{5832}}$          (i)   $\dfrac{7}{5}$

B. $\sqrt[3]{\dfrac{343}{125}}$          (ii)  $\dfrac{13}{8}$

C. $\sqrt[3]{\dfrac{-2197}{-512}}$          (iii) $\dfrac{1}{6}$

(iv) $\dfrac{-13}{8}$

Code :

(a)    A-ii, B-iv, C-i (b)    A-iii, B-i, C-ii

(c)    A-iv, B-ii, C-iii          (d)    A-i, B-iii, C-iv

If $x = \left(\dfrac{729}{2197}\right)^{1/3} + \left(\dfrac{9261}{42875}\right)^{1/3}$. Then x =

(a) $\dfrac{84}{65}$               (b) $\dfrac{94}{65}$

(c) $\dfrac{104}{65}$               (d) $\dfrac{124}{65}$

Q 6

If $x = \left(\dfrac{4}{9}\right)^{3} + \sqrt[3]{\dfrac{2744}{729}}$, then x =

(a) $\dfrac{1298}{729}$                    (b) $\dfrac{1200}{729}$

(c) $\dfrac{1198}{729}$                    (d) $\dfrac{1100}{729}$

Q 7

Q 8 One's place digit in the cube of 833 is
            (a)    7      (b)    3
            (c)    9      (d)    1

Q 9 What is the cube root of 531441?

Q 10 Find the smallest number by which 243 must be multiplied so that the product is a perfect cube.

If $3\sqrt{\frac{x}{y}} = \frac{2}{3}$ , then the value of $\frac{x}{y}$ is

(a) $\frac{2}{3}$                        (b) $\frac{4}{9}$

(c) $\frac{8}{27}$               (d) None of these

Q 11

Q 12 If 9A is a perfect cube number what will be the value of A.

Q 13 What will be the Unit place digit in cube root of 1331?

Q 14 Find the cube root of $\sqrt[3]{-2300 \times 5290}$ .

Q 15 Find the value of $\sqrt[3]{392} \times \sqrt[3]{448}$.

# 8. Comparing Quantities

Q 1 When 5% sale tax is added on the purchase of a bedsheet of Rs 300, find the buying price or the cost price of the bedsheet.

Mark (1)

Q 2 Find the ratio of the speed of a car 60 km/hr to the speed of a scooter 30 km/hr.

Mark (1)

Q 3 Find the ratio of 5 m to 10 km.

Mark (1)

Q 4 Convert the ratio 4 : 5 to percentage.

Mark (1)

Q 5 76% of 50 students are good in English. How many students are not good in English?

Mark (1)

Q 6 A table fan is bought for Rs 560 and expenses of Rs 40 are made on its repairs. It is sold at a profit of 5%. Find the selling price.

Mark (1)

Q 7 A man got 10% increase in his salary. If his original salary was Rs 30,000, find his new salary.

Mark (1)

Q 8 Find the amount on a principal of Rs 2000 for 2 years at 10% per annum compounded annually. Also find the compound interest.

Mark (1)

Q 9 An item marked at Rs 640 is sold for 560. What is the discount and discount%?

Mark (1)

Q 10 The price of a car was Rs 2,60,000 last year. It has increased 15% this year. What is the new price?

Mark (1)

Q 11 A table is sold at Rs 5000 after allowing a discount of 12.5%. Find its marked price.

Mark (1)

Q 12 Ram had Rs 400 left after spending 60% of his money. How much did he have in the beginning?

Marks (2)

Q 13 Shalu bought a water cooler for Rs 1100 including a tax of 10%. Find the price of the water cooler before the tax was added.

Marks (2)

Q 14 On selling a fan for Rs 810, Sunil gains 8%. For how much did he purchase it?

Marks (2)

Q 15 A scooter was bought at Rs 32,000. Its value depreciated at the rate of 8% per annum. Find its value after one year.

Marks (2)

Q 16 Find the compound interest on Rs 1,60,000 for 2 years at 10% per annum when compounded semi-annually.

Marks (2)

Q 17 If the cost price of 10 greeting cards is equal to the selling price of 8 greeting cards, find the gain or loss%.

Marks (2)

Q 18 Rishi bought a wrist watch for Rs 2200 and sold it for Rs 1980. Find his gain or loss%.

Marks (2)

Q 19 A cricket team won 10 matches out of the total matches they played. If their win percentage was 40, then how many matches did they play in all?

Marks (2)

Q 20 A shopkeeper offers his customers 10% discount and still makes a profit of 26%. What is the actual cost of an article marked Rs 280?

Marks (3)

Q 21 A person sells an article for Rs 550, gaining 1/10 of its C.P. Find gain%.

Marks (3)

Q 22 Rahul bought an air conditioner for Rs 22,000 including a tax of 10%. Find the price of the air conditioner before VAT was added.

Marks (3)

Q 23 Harish sold a bicycle at 8% gain. Had it been sold for Rs 75 more, the gain would have been 14%. Find the cost price of the bicycle.

Marks (3)

Q 24 Shruti borrows Rs 12,000 at 10% per annum for 3 years at simple interest and Shalini borrows the same amount for the same period at 8% per annum compounded annually. Who pays more interest and by how much?

Marks (3)

Q 25 Mr. Kashiv sold his old chair at a loss of 15%. If he had sold it for Rs. 800 more, he would have received a profit of 5%. Find the cost price of the table.

Marks (4)

Q 26 Rakesh bought a watch for Rs. 800 and sold it for Rs. 1000. Mukesh bought a car for Rs. 4,00,000 and sold it for Rs. 4,20,000. Who made a better sale, Rakesh or Mukesh?

Marks (4)

Q 27 A washing machine was sold for Rs. 5760 after giving successive discounts of 15% and 10% respectively. What was the marked price?

Marks (4)

Q 28 The marked price of a television is 25% more than the cost price. It is sold at a discount of 10%. If the marked price is Rs. 12,000, then find the cost price, selling price and the profit. What will be the percentage of profit?

Marks (4)

Q 29 In how much time will the simple interest on Rs. 3,500 at the rate of 6% per annum be the same as simple interest on Rs. 4,000 at 10.5% per annum for 4 years?

Marks (4)

Q 30 A man sold two of his buffaloes for Rs 20,000 each. On one, he made a profit of 5% and on the other, he lost 10%. Find his overall profit% or loss%.

Marks (5)

Q 31 Find the amount and compound interest on Rs 20,000 for 1.5 years at 10% per annum compounded half yearly. Would this interest be more than the interest he gets if it was compounded annually?

Marks (5)

Q 32 If 60% people speak Spanish, 30% speak English and the remaining speak other language, then what percent of the people speak other languages? If the total population is 50 lakhs, find the exact number of people who speak each type of language?

Marks (5)

## Most Important Questions

Q 1 Ratio is a means of comparing quantities of similar kinds. (T/F)

Q 2 Is 2:4 = 1:2?

Q 3 Percentages are a means of comparison. (T/F)

Q 4 Increase in price = old price + increase (True/False)

Q 5 Discount = _____ - _____

Q 6 Find the discount price of a skirt with a price of Rs 200 and a discount of 25%. What will be the sale price.

Q 7 What will be the price of petrol if its price now is Rs 50 and the hike is expected to be 12%?

Q 8 What will be the price of rice if its price now is Rs 25/kg and the reduction is expected to be 8 %?

Q 9 Convert into percentage: - a) 3 : 4

Q 10 What percent of the total distance of 100km is 22km?

Q 11 If M.P = Rs 650 and discount = 10% Find Sale Price

Q 12 A fan of M.P of Rs 1500 is sold for Rs 1080 after allowing a certain discount. Find the rate of discount

Q 13  A shirt with marked price Rs 1500 was sold to a customer for Rs 1080. Find the rate of discount allowed on the shirt.

Q 14 A team won 6 matches out of total that they played. If their winning percentage is 60 percent , what is the total number of matches they played? How many did they loose?

Q 15 What price should Kavita mark on an item, which costs her Rs 2200 so as to gain 26% after allowing a discount of 12%

Q 16 A cycle merchant allows 25% discount on the marked price of the cycle and still makes a profit of 20%. If he gains Rs 360 over the sale of one cycle find M.P of the cycle.

Q 17 A shopkeeper offers his customers 10% discount and still makes a profit of 26%. What is the actual cost to his of an article marked Rs 280.

Q 18  0.6 % can be expressed as

Q 19
$$Gain\% = \frac{Gain}{S.P} \times 100\%$$

Q 20
$$Discount = \frac{M.P. \times Discount\%}{100}$$

Q 21
$$Loss\% = \frac{(C.P. - S.P.)}{C.P.} \times 100\%$$

Q 22 If M.P = Rs x and discount = y%. Find S.P

Q 23 If C.P = Rs X and loss = A% Find S.P.

Q 24 If S.P = Rs. Y and Gain = B% find C.P

Q 25  Total Bill amount = Bill amount + Sales Tax% of (bill amount)     (T/F)

Q 26  Price including VAT = _____.

Q 27  To calculate the compound interest with the help of simple interest the Principal Amount of second year = _____

Q 28

If Principal Amount = P, Rate of Interest = r%, Time period = n years
Than compound Interest will be = _____

Q 29  The Difference between the original principal and last amount is said to be _____

Q 30  The time period after which interest is added each time to form a new principal is said to be _____

Q 31  What is the formula to calculate Simple interest?

Q 32  Write the formula for computing price including Sales Tax.

Q 33  A man purchased an article for Rs1000. He sold it by gaining two-fifth of its cost price. Find his S.P. of article.

Q 34  C.P = Rs. 225 , overhead charges = 15, S.P = Rs 300. Find loss or profit percent

Q 35  A fruit seller purchased 6 oranges for a rupee and sold them at the
rate of Rs 2.50 per dozen, find his gain or loss% .

Q 36  Find the Simple interest of Rs 8500 for 2 years at 8% p.a.

Q 37  Find the Compound interest on Rs 5000 for 1 yr at 8% p.a. compounded annually.

Q 38  Find the amount on Rs 16000 for 3 yrs at 5% p.a. compounded annually.

Q 39  The sale price of an article including the sales tax is Rs 616. The rate of sales tax is 10%. If the shopkeeper has made a profit of 12% then find the cost price.

Q 40  Find the Compound Interest on Rs 6400 for 2yrs compounded annually at 7½% p.a.

Q 41  Find the amount of Rs 12000 after 2yrs, compounded annually, the rate of interest being 5% p.a. during the 1$^{st}$ yr and 6% p.a. during the 2$^{nd}$ yr.

Q 42  If the C.P of 10 chairs be equal to S.P of 16 chairs. Find gain or loss percent

Q 43  Sabena bought 16 dozen-ball pens and sold them at a loss equal to S.P of 8 ball pens. Find her loss%

Q 44  Find the difference between the compound interest and the simple interest on Rs 32000 at 12% p.a. for 3 yrs.

Q 45  A charity purchased 100 blankets at Rs 2000 each. They found that 10 blankets were defective and they sold these at Rs 1200 each. At what rate should they sell the remaining blankets so as to gain 14% on the whole?

Q 46  Rajan bought two buffaloes for Rs 30000. By selling one at a loss of 15% and other at a gain of 19%, he found that selling price of both buffaloes is the same. Fine the C.P of each.

Q 47 A man sold two articles at Rs 25920 each. These were sold at 8% gain and 4% loss respectively. Find the gain or loss present in the whole transaction.

Q 48 In how much time will a sum of Rs 1000 amount to Rs 1331.20 at 10% p.a. Compound interest?

Q 49  At what rate % p.a. will a sum of Rs 7500 amount to Rs 8427 in 2 yrs, compounded annually?

Q 50 Semi annual means _____.

Q 51 Quarterly means every _____ months in a year.

Q 52 There are _____ conversion periods when the interest is computed half-yearly.

Q 53 There are _____ conversion periods when the interest is computed quarterly.

Q 54 What is the formula for finding increased population during n years?

Q 55 If the growth rate of a company's employees is r% every year and there head count in 2004 was x million, find their head count in 2009?

Q 56 If the value of a car depreciates by 6 % each year and its current value is 3 lakhs, find its value the next yr.

Q 57 When the interest is calculated semi-annually, the rate of interest of each conversion period is _____ & the time period gets _____.

Q 58 When the interest is calculated quarterly, the rate of interest of each conversion period becomes _____ & the time period becomes _____.

Q 59 Compound Interest formula is applicable in following cases (T/F).
a) To calculate Increase/Decrease in population.
b) Calculating value of an item increasing/decreasing over a number  of years.

Q 60 What will be the compound interest on Rs1000 at the rate of 8% per annum for 1 and ½ years when interest is compounded quarterly.

Q 61 Find the compound interest on Rs14,000 at the rate of 12% per annum for 1 and 1/2 years when interest is compounded semi-annually.

Q 62  Rakesh bought a scooter for Rs 42,000. If its value decreases by 8% every year, find its value at the end of 2 years.

Q 63  Find the amount to be paid on a  loan of Rs 50,000 for 3 years at 12% per annum compounded semi-annually.

Q 64 The bacteria in our hands grow at the rate of 20% every hour. What will be their count after 3 hrs if their initial count is 5 lakhs.

Q 65  The population of the world in 2008 is 6 billion. It increases at a rate of 1.5% every year. What will be the population 2 years from now? Also estimate what would have been the population in 2006?

# 9. Algebraic Expressions and Identities

Q 1 Using identity $(x - a)(x + a) = x^2 - a^2$ find $6^2 - 5^2$.

Mark (1)

Q 2 Find the product of $(7x - 4y)$ and $(3x - 7y)$.

Mark (1)

Q 3 Using suitable identity find $(a + 3)(a + 2)$.

Mark (1)

Q 4 Using identity $(a + b)^2 = a^2 + 2ab + b^2$ find the value of $103^2$.

Mark (1)

Q 5 Using identity $(a - b)^2 = a^2 - 2ab + b^2$ find the value of $98^2$.

Mark (1)

Q 6 Using identity find $(2x + 3)^2$.

Mark (1)

Q 7 Subtract $7x - 3x^2$ from $4x + 8x^2$.

Mark (1)

Q 8 Using suitable identity find $(7x - 3y)^2$.

Mark (1)

Q 9 Add $4x^2 + 2xy - 4$ and $7x^2 - 3xy + 4$.

Mark (1)

Q 10 Find the product of $4x, 7x^2, -2x$.

Mark (1)

Q 11 Find the product of $(x^2 - y^2)(2x + y)$.

Marks (2)

Q 12 Simplify: $(xy + yz)^2 - (xy - yz)^2$

Marks (2)

Q 13 Using identity find the product of $\left( \dfrac{a}{2} + \dfrac{3b}{4} \right) \left( \dfrac{a}{2} + \dfrac{3b}{4} \right)$

Marks (2)

Q 14 Multiply: $(a^2 + 2c^2)(3a - 3c)$

Marks (2)

Q 15 Simplify: $(x + y)(2x - 3y + z) - (2x - 3y)z$

Marks (2)

Q 16 Subtract 3x (x − 4y + 5z) from 4x (2x − 3y + 10z).

Marks (2)

Q 17 Simplify: $(x^2 − y^2)^2$

Marks (2)

Q 18 Using suitable identity find the product of $\left(\dfrac{2}{3}x − 5\right)\left(\dfrac{2}{3}x + 5\right)$.

Marks (2)

Q 19 Simplify 3a(4a - 5) + 3 and find its value for a = 3.

Marks (2)

Q 20 Using suitable identity find $(6x^2 − 5/3)^2$.

Marks (2)

Q 21 Using identity $a^2 - b^2 = (a + b)\,(a − b)$,
find $(1.02)^2 − (0.98)^2$.

Marks (3)

Q 22 Using $(x + a)\,(x + b) = x^2 + (a +b)\,x + ab$ find $105 \times 107$.

Marks (3)

Q 23 Using identity find the value of $(7.2)^2$.

Marks (3)

Q 24 Using identity evaluate $297 \times 303$.

Marks (3)

Q 25 Using identity find the value of $(4.7)^2$.

Marks (3)

Q 26

Simplify $\left(\dfrac{5}{3}x + \dfrac{3}{4}y\right)^2 − \left(\dfrac{5}{3}x - \dfrac{3}{4}y\right)^2$ and also evaluate it when x = 2 and y = -1.

Marks (4)

Q 27 Simplify $(xy + yz)^2 − 2x^2y^2z$.  Find the value when x = -1,
y = 1 and z = 2.

Marks (4)

Q 28 Simplify: (1.5x − 4y)(1.5x + 4y +3) − 4.5x +12y

Marks (4)

Q 1 What are algebraic expressions?

Q 2 Expressions consists of _____ & _____ .

Q 3 T/F.
The value of an expression changes with the value chosen for the variables it contains.

Q 4 When numbers/literals are added or subtracted, they are called _____ .

Q 5 When numbers/literals are multiplied, they are called _____.

Q 6 The terms in the expression 4ab + 5a(b + c) are:

Q 7 The factors in the term 5a(b + c) are :

Q 8 A monomial is an expression in which _____ .

Q 9 A binomial is an expression in which _____ .

Q 10 While multiplying two monomials, Coefficient of product = _____ X _____.

Q 11 Identify the terms, their coefficients for the expression:
0.75x + 0.44 y + 1. 56 zx

Q 12 Classify the following as binimials and trinomials:

     2a + 3b, 2x+3y-5, a+4, 12x+13y+17z

Q 13 What are the polynomials? Give an example.

Q 14 What are like and unlike terms?

Q 15 Classify as like and unlike terms:
2abc        and bac,
$x^2y^2z$        and $y^2zx^2$.
7x            and   3y
xy+z        and xyz

Q 16 Add:

$2p^2q^2 - 3pq + 4$ &

$5 + 7pq - 3p^2q^2$

Q 17 Add: $-8x^2 + 2y^2z - 11$ and $-2x^2 + 9y^2z - 1$

Q 18 Subtract $4p^2q + 5pq + 5pq^2 - 8p + 7q - 10$ from $18 - 3p - 11q + 5pq - 2pq^2 + 5p^2q$

Q 19 Find the product of : $2z, 4y, 2y^2$ & $6xyz$

Q 20 Find : a) $13mn \times 13np$

b) $-4xy \times -7x^2y$

Q 21 State the distributive property.

Q 22 T/F: n ( 4 + m) = 4n + nm

Q 23 T/F : p( 9 – p) = 9p – 2p

Q 24 Whenever we multiply a binomial by a binomial, we get _____terms in the product.

Q 25 Whenever we multiply a binomial by a trinomial, we get ____terms in the product.

Q 26 Find : $a^2$(2ab - 5c)

Q 27 Simplify x(x - 3) + 2 and evaluate for x= 2.

Q 28
Find:

$$\left(-\frac{7}{3}pq\right) \times \left(\frac{6}{5}pqr\right)$$

Q 29 Find : $(3x^6) \times (6x^{12}) \times (9x^{18})$

Q 30 Find using distributive property :

125 X 42

Q 31 Find : $ab(a^2 + bc + c^2)$

Q 32

Find : $5m(m^2 + m + 1)$ and evaluate for $m = 1$.

Multiply :

Q 33 $(2.5a - 0.5b)$ and $(2.5a + 0.5b + c)$

Q 34 Multiply : $(ab + 5)(a + c^2)(b + 6)$

Q 35 Simplify : $(m + n)(3m + n) + (m + 2n)((m - n)$

Q 36 Simplify: $(3.5e - 4.5f)(1.5e + 4f + ef) - 4.5e + 10f$

Q 37 Simplify : $(3.5e - 4.5f)(1.5e + 4f + ef) - 4.5e + 10f$

Q 38 What is an identity.

Q 39 True/False
An equation, which is true for only certain values of the variable in it, is not an identity.

Q 40 $(x + a)(x + b) = $ _____

Q 41 $(a - b)^2 = $ _____

Q 42 $(x - a)(x + a) =$ _____.

Q 43 If $x + \dfrac{1}{x} = 6$, find $x^2 + \dfrac{1}{x^2}$.

Q 44 If $x + y = 12$ and $xy = 32$. Find the value of $x^2 + y^2$.

Q 45 Find using identities: $106^2$

Q 46 Find using identities:
$(4.8)^2$

Q 47 Find using identities:
$(-p + q)(-p + q)$

Q 48 Find : $(2x + 5y)(2x + 3y)$

Q 49 Find : $(2x - y)(2x + y)(4x^2 + y^2)$

Q 50 Multiply :

$[\, p^2 + (qr)^2 \,][\, p^2 - (qr)^2 \,]$

and evaluate for $p = 1$, $q = 2$, $r = 3$.

Q 51 Derive the identity : $(x + a)(x + b) = x^2 + (a + b)x + ab$

Q 52 Find the product : $\left(a - \dfrac{b}{2} - 1\right)\left(a + \dfrac{b}{2} + 1\right)$

# 10.   Visualizing Solid Shapes

Q 1 What is a hexogonal prism?

Mark (1)

Q 2 How many vertices are there in a pyramid with a square base?

Mark (1)

Q 3 How many edges are there in a cuboid?

Mark (1)

Q 4 How many edges are there in a triangular pyramid?

Mark (1)

Q 5 How many vertices are there in a triangular pyramid?

Mark (1)

Q 6 How many faces are there in a triangular prism?

Mark (1)

Q 7 What are the three views in a solid?
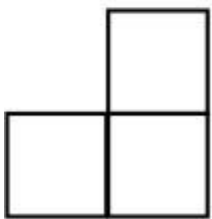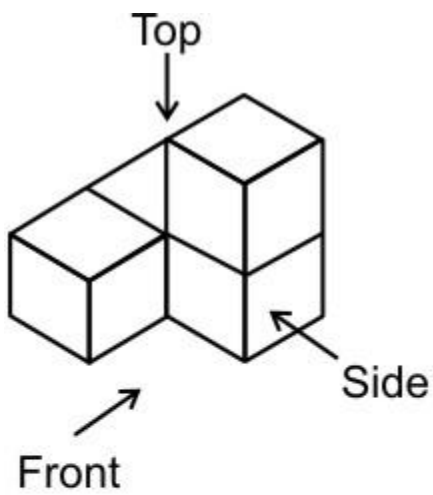
Mark (1)

Q 8 What are regular polyhedrons?

Mark (1)

Q 9 A pyramid with square base has 5 faces and 8 edges. By Euler's formula, find the vertices of the pyramid.
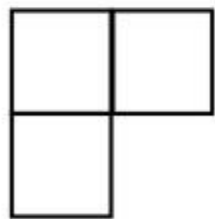
Marks (2)

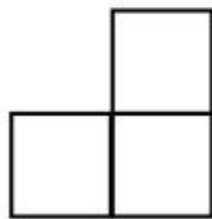Q 10 Can a polyhedron have 20 faces, 40 edges and 30 vertices?

Marks (2)

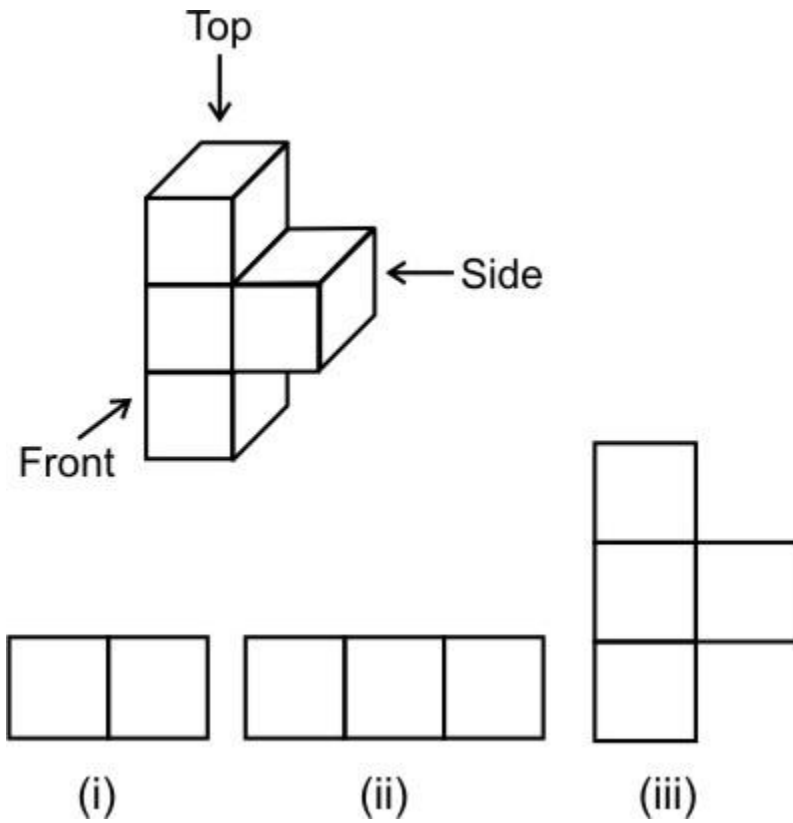Q 11 For the given solid, identify the top view, front view and side view.

Top

Side

Front

(i)          (ii)          (iii)

Marks (2)

Q 12 Identify the top view, front view and side view for the given solid.

(i)          (ii)          (iii)

Marks (2)

Q 13 Give two basic differences between a prism and a pyramid.

Marks (2)

Q 14 Can a polyhedron have for its faces

a) 3 triangles?

b) a square and four triangles?

Marks (2)

Q 15 Give the importance of the scale in a map.

Marks (2)

Q 16 Give two differences between a picture and a map.

Marks (2)

Q 17 State and verify the Euler's Formula for a rectangular prism.
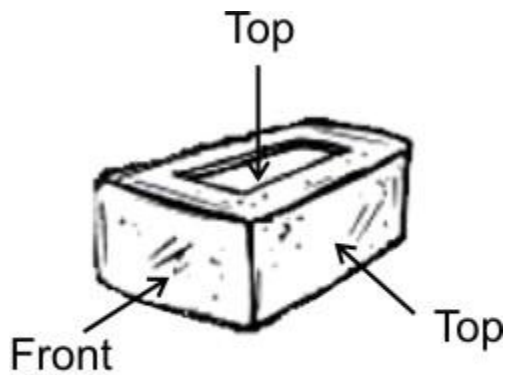
Marks (2)

Q 18 Find the number of edges, vertices and faces in a cylinder.

Marks (2)

Q 19 State and verify the Euler's Formula for a cube.

Marks (2)
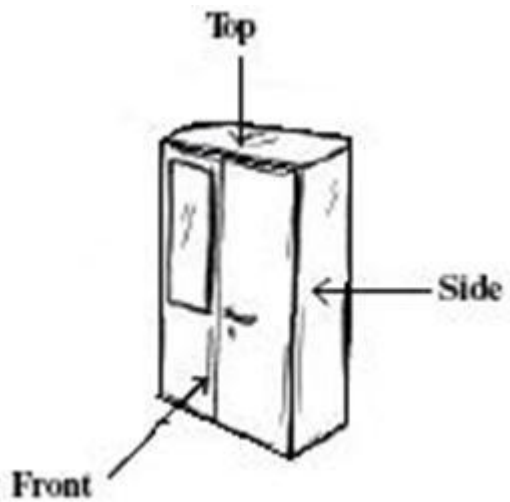
Q 20 Draw the three views of a brick.



Top

Front

Top

A brick

Marks (3)

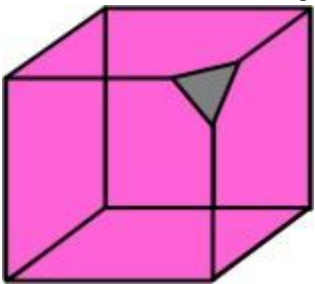Q 21 Draw the front, side and top view of an almirah.



Marks (3)

Q 22 Find the number of edges, vertices and faces in a rectangular pyramid.

Marks (3)

Q 23 Find the number of edges, vertices and faces in a given solid.



Marks (3)

Q 24 State and verify the Euler's Formula for a triangular pyramid.

Marks (3)

Q 25 Draw the front, side and top view of a television.
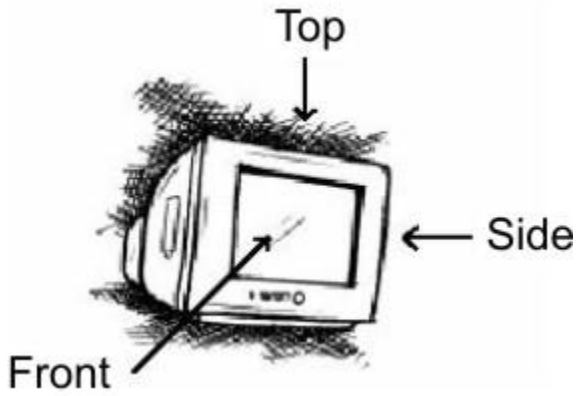


Marks (3)

Q 26 By using Euler's formula find the unknown.

a) Vertices = 12 , Faces = 4, Edges = ?

b) Faces = 5 , Edges = 8, Vertices = ?

c) Edges = 2 , Vertices = 3, Faces = ?

Marks (3)

Q 27 Look at the map given below:



Answer the following:

(a) Mark a green 'X' at the intersection of Church Street and High Street and a blue 'Y' at the intersection of North Street and Leret Way.

(b) Highlight the shortest street route followed by Annie from her current position to the Institute in pink.

(c) Which is further east, The Swan Centre or Institute?

Marks (5)

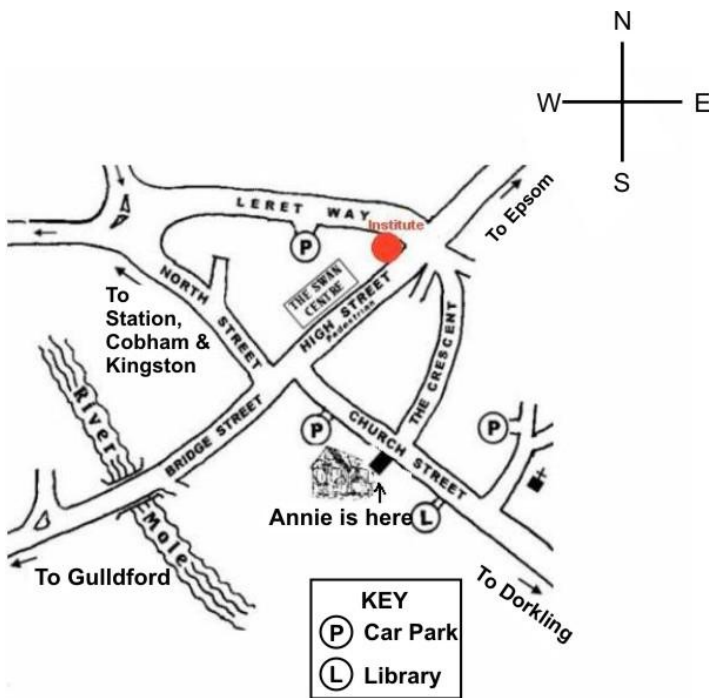Q 1 What are two-dimensional shapes?

Q 2 What are three-dimensional shapes?

Q 3 T/F.

       If we add the dimension 'height' to a rectangle(with certain length & breadth),we obtain a cuboid.

Q 4 A three dimensional shape is _____ object.( solid/plane)

Q 5 A two dimensional shape is _____ shape.(solid/plane)

Q 6 The three views in a solid are:

Q 7 The most important part of a map is the _____.(scale, location)

Q 8 _____ are used to depict different objects/places in a map.(Symbols/landmarks)

Q 9 T/F:

In a map, places that are far & those that are near,will be of the same size to an observer.

Q 10 State the Euler's Formula for polyhedrons.

Q 11 Give two examples of 2d & 3d shapes each.

Q 12 Give two differences between a picture & a map.

Q 13 Give the importance of the scale in a map.

Q 14 What are polyhedrons? Give two exs.

Q 15 Give two basic differences between a prism & a pyramid.

Q 16 Verify the Euler`s formula for a Square-pyramid:
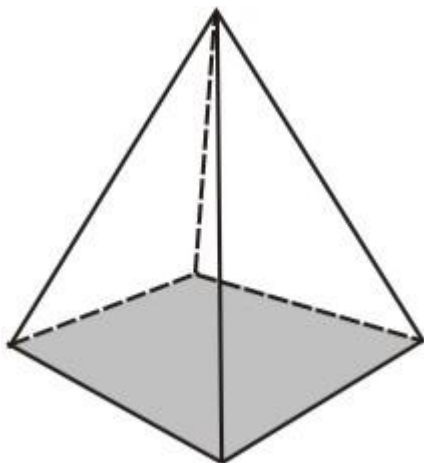
Q 17 Draw the three views of a brick.

Q 18 Define :

a) Face       b) Edge       c) Vertex

Q 19 A pentagonal prism has _____ faces, _____ edges & _____ vertices.

Q 20 A hexagonal pyramid has _____ faces, _____ edges & _____ vertices.

Q 21 Match the front, side & top views of the following :



(i)          (ii)          (iii)

# 11.   Mensuration

Q 1 Find the volume of a cuboid whose length is 8 cm, breadth 6 cm and height 3.5 cm.
<div align="center">Mark (1)</div>

Q 2 Find the altitude of a trapezium, the sum of the lengths of whose bases is 6.5 cm and whose area is 26 cm$^2$.
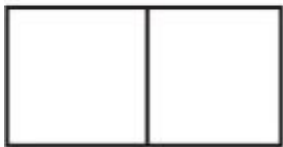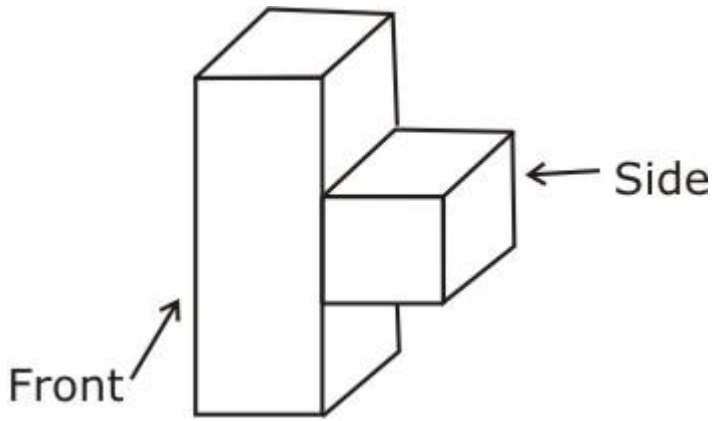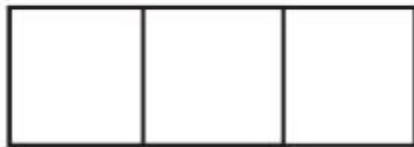<div align="center">Mark (1)</div>

Q 3 Find the height of a cuboid whose volume is 275 cm$^3$ and base area is 25 cm$^2$.
<div align="center">Mark (1)</div>

Q 4 Find the area of a rhombus whose diagonals are of measurements 6 cm and 8 cm.
<div align="center">Mark (1)</div>

Q 5 Find the volume of the cylinder whose base diameter is 14 cm and height is 10 cm.
<div align="center">Mark (1)</div>

Q 6 Find the area of a triangle whose base is 4 cm and altitude is 6 cm.
<div align="center">Mark (1)</div>

Q 7 Find the total surface area of a cube whose volume is 343 cm$^3$.
<div align="center">Marks (2)</div>

Q 8 Find the side of a cube whose surface area is 2400 cm$^2$.
<div align="center">Marks (2)</div>

Q 9 How many bricks will be required for a wall which is 8 m long, 6m high and 22.5 cm thick, if each brick measures 25 cm $\times$ 11.25 cm $\times$ 6 cm?
<div align="center">Marks (2)</div>

Q 10 The diameter of garden roller is 1.4 m and it is 2 m long. How much area will it cover in 5 revolutions?
<div align="center">Marks (2)</div>

Q 11 Find the volume of a cuboid whose length is 8 cm, width is 3 cm and height is 5 cm.
<div align="center">Marks (2)</div>

Q 12 A cylindrical tank has a capacity of 5632 m$^3$. If the diameter of its base is 16 m, find its depth.
<div align="center">Marks (2)</div>
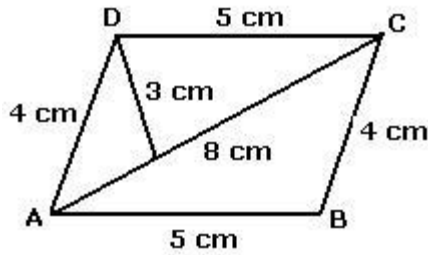
Q 13 Find the volume of 64 cubes whose one side is 4 cm.
<div align="center">Marks (2)</div>

Q 14 Find the volume of a cylinder whose base radius is 14 cm and height is 35 cm.
<div align="center">Marks (2)</div>

Q 15 Find the area of a parallelogram whose measurements are given in the following figure.



Marks (2)

Q 16 Find the total surface area of a cylinder whose base radius is 8 cm and height is 14 cm.

Marks (2)

Q 17 Find the area of a rhombus whose diagonals are of lengths 20 cm and 16 cm.

Marks (2)

Q 18 Find the height of cuboid whose volume is 490 cm$^3$ and base area is 35 cm$^2$.

Marks (2)

Q 19 Find the volume of the cylinder whose height is 7 cm and radius is 20 cm.

Marks (2)

Q 20 Find the side of a cube whose surface area is 2400 cm$^2$.

Marks (2)

Q 21 The diagonal of a quadrilateral shaped field is 24 cm and perpendicular dropped on it from the remaining opposite vertices are 6 m and 12 m. Find the area of the field.

Marks (3)

Q 22 A godown is in the form of a cuboid of measures 60 m $\times$ 40 m $\times$ 20 m. How many cuboidal boxes can be stored in it if the volume of one box 0.8 m$^3$?

Marks (3)

Q 23 The internal measures of a cuboidal room are 10 m $\times$ 8 m $\times$ 4 m. Find the total cost of whitewashing four walls of a room, if the cost of white washing is Rs 5 per m$^2$.

Marks (3)

Q 24 Find the area of a rhombus whose side is 5 cm and its altitude is 4 cm. If one of its diagonal is 8 cm long, find the length of the other diagonal.

Marks (3)

Q 25 In a building there are 4 cylindrical pillars. The radius of each pillar is 21 cm and height is 5 m. Find the curved surface area of four pillars.

Marks (3)

Q 26 A rectangular paper of width 7 cm is rolled along its width and a cylinder of radius 20 cm is formed. Find the volume of the cylinder.

Marks (3)

Q 27 The perimeter of a trapezium is 52 cm. Its non-parallel sides are 10 cm each and the distance between two parallel sides is 8 cm. Find the area of the trapezium.

Marks (3)

Q 28 The parallel sides of a trapezium are 25 cm and 13 cm. Its non-parallel sides are equal, each being 10 cm. Find the area of the trapezium.
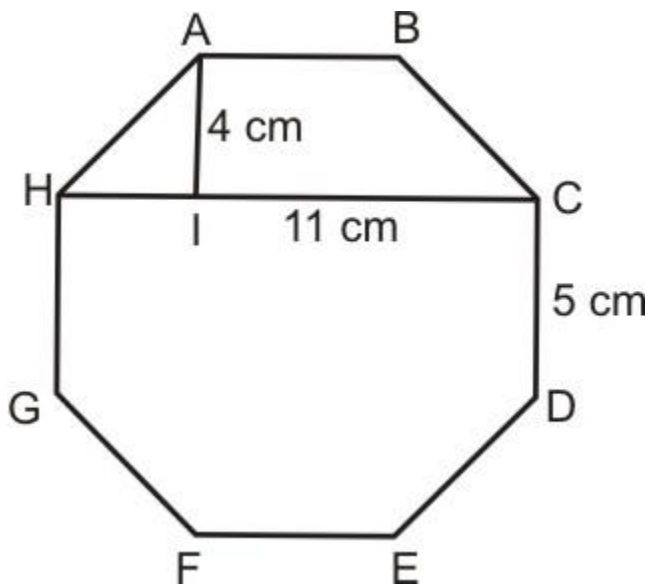
Marks (4)

Q 29 The area of a trapezium is 384 cm$^2$. Its parallel sides are in the ratio 3:5 and the distance between them is 12 cm. Find the length of each
parallel side.

Marks (4)

Q 30 A cylindrical tube, open at both ends is made of metal. The internal diameter of the tube is 10.4 cm and its length is 25 cm. The thickness of the metal is 8 mm everywhere. Calculate the volume of the metal in the cylinder.

Marks (4)

Q 31 The top surface of a box is in the shape of a regular octagon as shown in the figure. Find the area of the octagonal surface.



Marks (4)

Q 32 A pool is 20 m long, 15 m broad and 4 m deep. Find the cost of cementing its floor and its walls at the rate of Rs. 12 per square metre.

Marks (4)

Q 33 A cylindrical container of radius 28 cm contains sufficient water to submerge a rectangular solid of dimensions 32 cm $\times$ 22 cm $\times$ 14 cm. Find the rise in the level of water, when the solid is completely submerged.

Marks (4)

Q 34 A rectangular piece of iron sheet is 44 m long and 20 m broad. It is rolled along its length to form a cylinder. Find the volume of the cylinder so formed.

Marks (4)

Q 35 The cost of papering the wall of a room, 12 m long, at the rate of Rs. 1.35 per square meter is Rs. 340.20. The cost of matting the floor at Re. 0.85 per square metre is Rs. 91.80. Find the height of the room.

Marks (4)

Q 36 A tin is in a cylindrical shape whose base has a diameter of 14 cm and height 20 cm. A label is placed around the surface of the container. If the label is placed 2 cm from top and bottom, what is the area of the label?

Marks (5)

Q 37 A rectangle piece of metal sheet 11 m x 4 m is folded without overlapping to make a cylinder of height 4 m. Find the volume of the cylinder.

Marks (5)

| Most Important Questions |
| --- |

Q 1 Find the perimeter and area of the given figure:
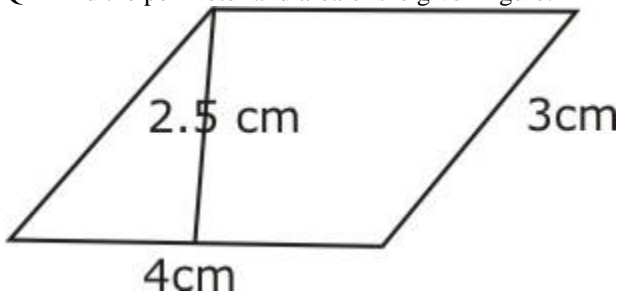


Q 2 Square and a rectangle have the same perimeter; if the side of the square is 16m and the length of the rectangle is 18 m, find the breadth of the rectangle.

Q 3 Radha bought a rectangular plot of dimensions 120 m x 80 m and Radhika bought a square field of dimension 95 m. Who bought plot of greater area and by how much?

Q 4 Find the area of the field whose sides have semi-circular flowerbeds, as given in the figure.
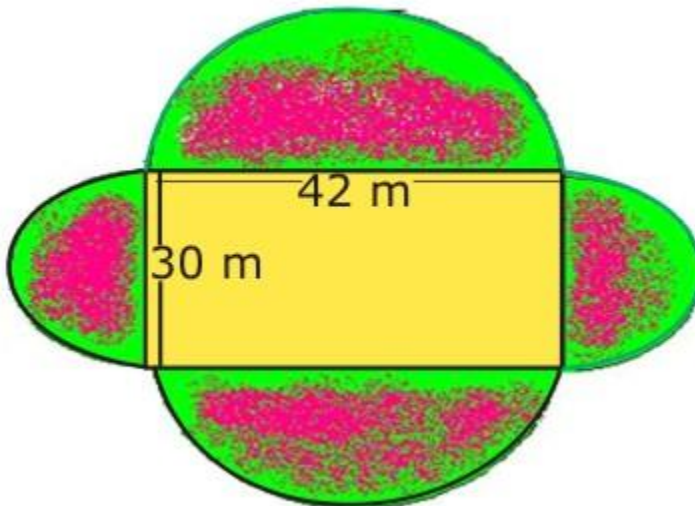
Q 5 Find the perimeter of the given figure
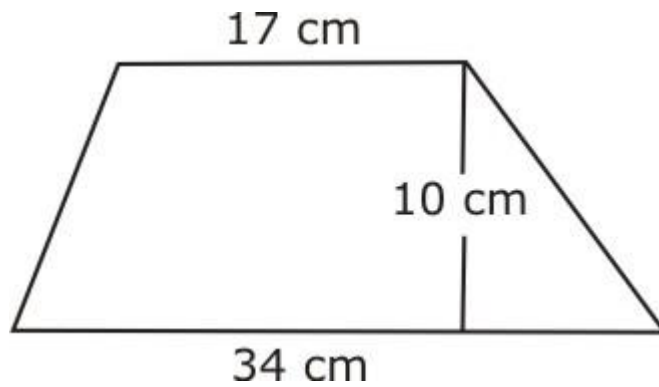


Q 6 Find the area of the following trapezium

Q 7 The diagonals of a rhombus are 16 cm and 12 cm, find

   a) Its area

   b) Its length of the side

   c) Its perimeter
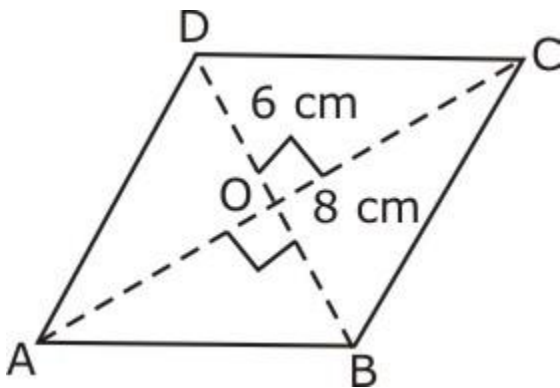


Q 8 The parallel sides of a trapezium are in the ratio 2: 3 and the area of the trapezium is 125 cm². The distance between the parallel lines is 10 cm. Find the length of the parallel sides of the trapezium.
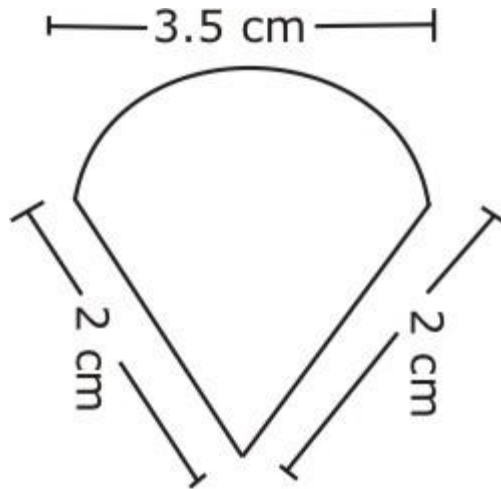
Q 9 The parallel sides of a trapezium are in the ratio 2: 3 and the area of the trapezium is 125 cm². The distance between the parallel lines is 10 cm. Find the length of the parallel sides of the trapezium.
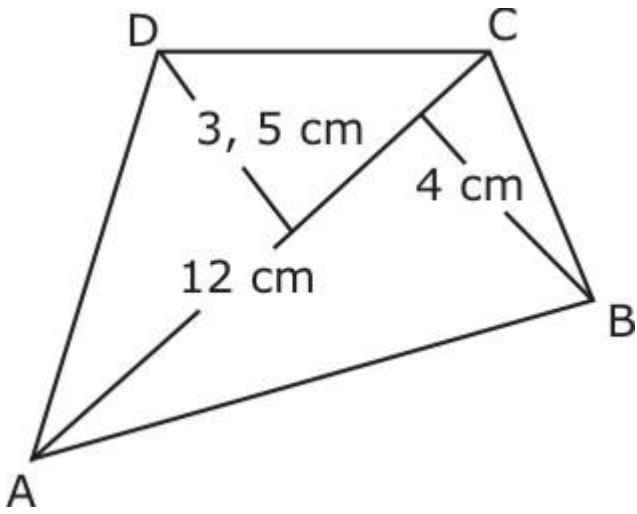
Q 10 Find the area of the given quadrilateral A

Q 11 In the given figure find the area of the path
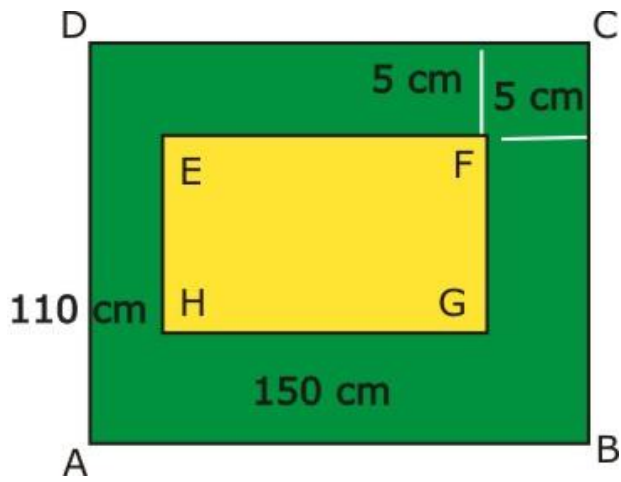


Q 12 Find the area of the roads, if two roads are running in cross-section, through the middle of a ground,
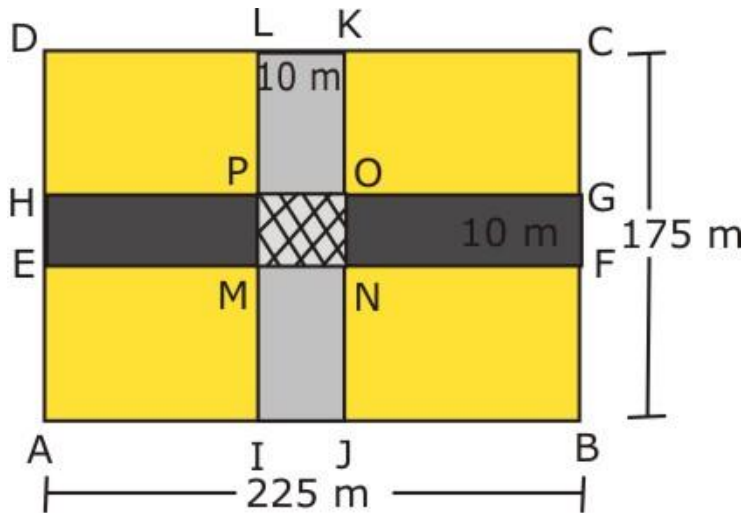
Q 13 Find the area and perimeter of the dollhouse.
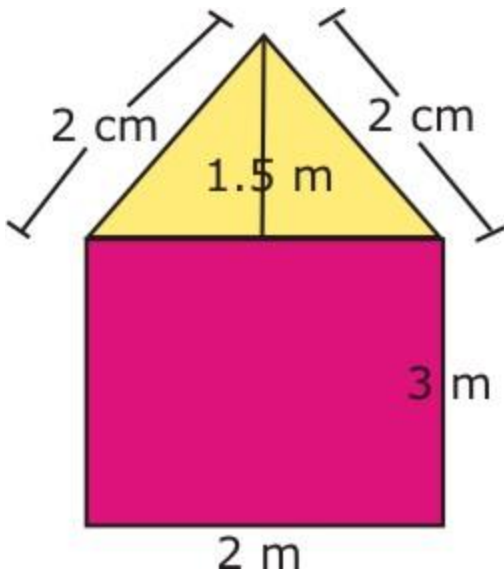


Q 14 Find the area of the given octagon, by using suitable method
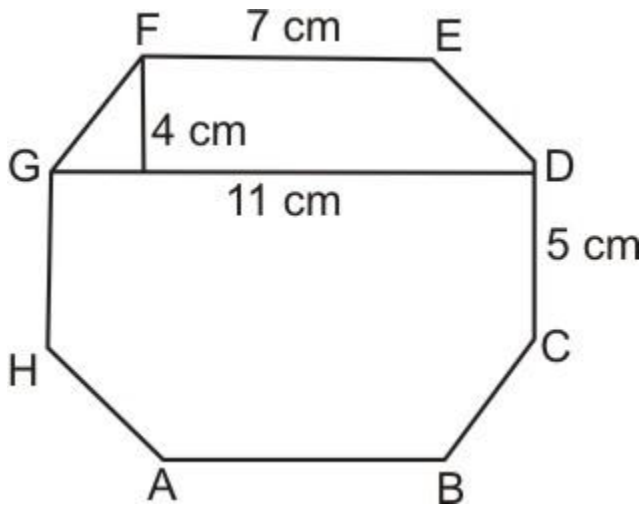


Q 15 In the given figure of a cube and a cuboid which one has a greater surface area and by how much?
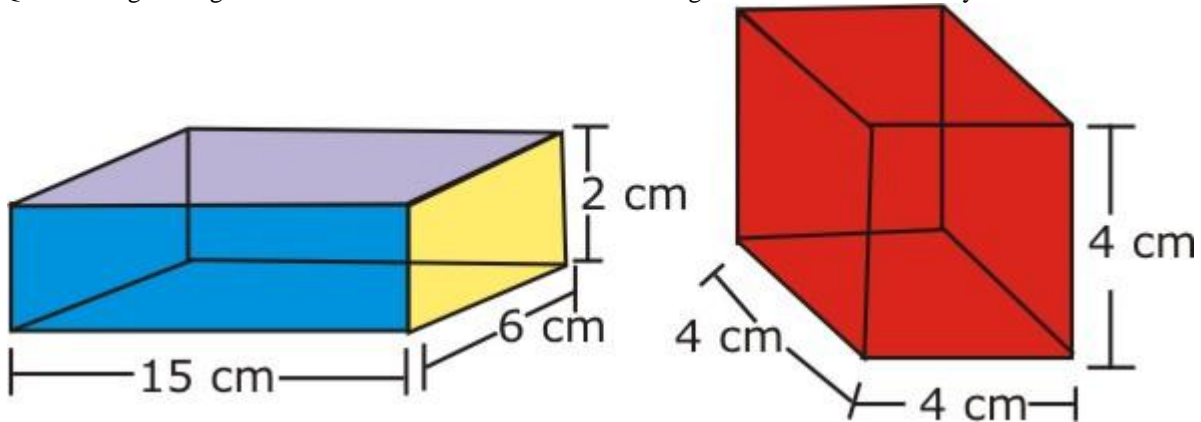


Q 16 The walls of a house of dimension 15 m x 12 m x 8 m are to be painted along with the ceiling at the rate of Rs.43 per m². Find the total cost of painting.

Q 17 A talcum powder can is made of aluminium sheet, it is cylindrical in shape the height of the cylindrical can is 6 cm and the radius of the base is 1.4 cm, How much aluminium sheet is require to make 200 such cans?

Q 18 Three cubes of side 4 cm are joined to form a cuboid, find the surface area of the resulting cuboid.

Q 19 A wooden table has to be varnished on all the sides, leaving the bottom at the rate of Rs. 12.50 per $m^2$. If the dimensions of the table are 50 cm x 27 cm x 70 cm, find the cost of varnishing the total surface.
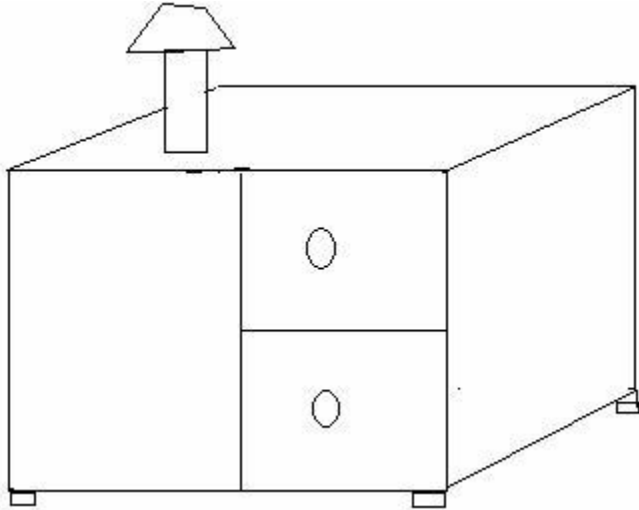


Q 20 Find the height of a cylinder whose radius is 7 cm and the total surface area is 968 $cm^2$.

Q 21 The lateral surface area of a hollow cylinder is 4224 $cm^2$, it is cut along its height to get a rectangular sheet of width 33 cm. Find the perimeter of the rectangular sheet.

Q 22 A closed cylindrical tank of radius 7 m and height 3 m is made from a sheet of metal. How much metal sheet is required?

Q 23 Find the volume of a cuboid of dimension 12cm x  5 cm x 8 cm.

Q 24 Find the side of a cube whose volume is 216 $m^3$, also find the lateral surface area of the cube.

Q 25 Find the volume of the cube in $cm^3$, whose side is 6 dm.

Q 26 Identify the cases where we have to find volume and where to find the surface area:

       a)   Painting the surface of a box.

       b)   Filling water in a cylinder.

       c)    Wrapping a gift.

       d)   Filling oil in the can.

Q 27 A cylinder of height 7 cm and base diameter 3 cm is filled up with orange juice. How much juice can it hold?

Q 28 Find the height of a cuboid whose volume is 300 cm$^3$ and base area is 60 cm$^2$.

Q 29 A rectangular aluminium sheet of dimensions 11 cm x 4 cm is folded without overlapping to make a cylinder of height 4 cm. Find the volume of the cylinder so formed.

Q 30 The capacity of a tank, which is cuboidal in shape, is 50,000 l. Find the breadth of the tank if its length and depth are respectively 2.5 m and 10 m.

Q 31 The trunk of a tree is cylindrical in shape and its circumference is 176 c m. If the length of the trunk is 3 m. Find the volume of timber that can be obtained from the trunk.

Q 32 A solid cube of side 12 cm is cut into 8 cubes of equal volume. What will be the side of the new cube?

## 12.   Exponents and Powers

Q 1

$$(-2)^5 \div (-2)^8$$

Mark (1)

Q 2 Simplify: $(-3)^2 \times (5/3)^2$

Mark (1)

Q 3 Find the value of $\left[\left(\dfrac{-2}{3}\right)^{-2}\right]^1$.

Mark (1)

Q 4 Express $3 \times 10^{-7}$ in usual form.

Mark (1)

Q 5 Evaluate $6^{-2}$.

Mark (1)

Q 6 Write 0.000021 in standard form.

Mark (1)

Q 7 Write 41860000000 in standard form.

Mark (1)

Q 8 Express $4.5 \times 10^4$ in usual form.

Mark (1)

Q 9 Evaluate: $(2^{-1} + 3^{-1} + 4^{-1})^0$

Mark (1)

Q 10 Find the value of $(4^{-1} \times 2^{-1}) \times 3^{-1}$.

Mark (1)

Q 11 Expand 1526.26 using exponents.

Marks (2)

Q 12 Expand 1026.13 using exponents.

Marks (2)

Q 13 Find x such that $(-2)^{x+1} \times (-2)^5 = (-2)^7$.

Marks (2)

Q 14 Express $8^{-3}$ as power with the base 2.

Marks (2)

Q 15 Simplify $(-2)^{-3}$ x $(-3)^{-3}$ x $(4)^{-3}$ and write the answer in exponential form.

Marks (2)

Q 16 Find the value of $(4^0 + 3^{-1})$ x $3^2$.

Marks (2)

Q 17 Simplify: $2^3$ x $2^{-5}$ x $2^6$

Marks (2)

Q 18 Find the value of $\left(\dfrac{1}{2}\right)^{-2} + \left(\dfrac{1}{3}\right)^{-2} + \left(\dfrac{1}{4}\right)^{-2}$.

Marks (2)

Q 19 Find the value of $\left(\dfrac{5}{7}\right)^{-2}$.

Marks (2)

Q 20 Simplify: $(-3)^4 \times \left(\dfrac{1}{3}\right)^4$

Marks (2)

Q 21 Simplify $\left[\left(\dfrac{1}{3}\right)^{-2} - \left(\dfrac{1}{2}\right)^{-2}\right] \div \left(\dfrac{1}{4}\right)^{-2}$.

Marks (3)

Q 22 Evaluate $\left(\dfrac{5}{9}\right)^{-7} \times \left(\dfrac{9}{5}\right)^{-4}$.

Marks (3)

Q 23 In a stack there are 6 books each of thickness 20 mm and 5 sheets each of thickness 0.015 mm. Find the total thickness of the stack?

Marks (3)

Q 24 Find 'a' such that $(-5)^{a+2}$ x $(-5)^4 = (-5)^9$.

Marks (3)

Q 25 Simplify $\left(\dfrac{2}{3}\right)^{-7} \times \left(\dfrac{3}{2}\right)^{-5}$ .

Marks (3)

Q 26

Simplify $\dfrac{25 \times a^{-4}}{5^{-3} \times 10 \times a^{-8}}$ , Where a $\neq 0$

Marks (3)

Q 27 Compare the size of a red blood cell which is 0.000007 m to that of a plant cell which is 0.00001275 m.

Marks (5)

Q 28 Simplify $\dfrac{3^{-5} \times 10^{-5} \times 125}{6^{-5} \times 5^{-7}}$ .

Marks (5)

| Most Important Questions |
| --- |

Q 1 Find the value of

   a)   $2^2$

   b) $2^{-2}$

Q 2 Find the value of $(1/2)^{-1}$ .

Q 3 Calculate the value of $2^3 \times 2^4$

Q 4 What is the exponential notation of $(2^3)^5$

Q 5 Simplify and express in positive exponential form.

   $(-3)^{-7} \times (-3)^{-8}$

Q 6 Simplify the following exponents

$(-2)^2$ x $(-3)^2$ x $(-5)^2$

Q 7 Find the value of n in the given expression:

$2^{2(n-1)}$ x $2^{3n} = 2^{n+1}$

Q 8 Find the value of p in the given expression

$(-3)^{p-3}$ $(-3)^{-3p+1} = (-3)^5$

Q 9 Write the given expressions in expanded form.

    a)   3456.234

    b)   2016.123

Q 10 Express the following numbers in their standard form.

    a)   0.0000000000468

    b)   0.345

    c)   372400000000000

    d)   76100000000

Q 11 Express the following numbers in their usual form:

    a)   $3.05 \times 10^{-6}$

    b)   $4.5 \times 10^4$

    c)   $3.1563 \times 10^6$

# 13.    Direct and Inverse Proportions

Q 1 If 9 kg of rice costs Rs 166.50, how much rice can be purchased for Rs 259?

Mark (1)

Q 2 If a car covers 80 km in 5 litres of petrol, how much distance will it cover in 13 litres of petrol?

Mark (1)

Q 3 If 32 men can reap a field in 15 days, in how many days can 20 men reap the same field?

Mark (1)

Q 4 If 36 men can do a work in 25 days, in how many days will 15 men do the same work?

Mark (1)

Q 5 If 4 kg of potatoes cost Rs 60, what is the cost of 12 kg of potatoes?

Mark (1)

Q 6 A tank travels 15 km in 25 minutes. If the speed remains the same, how far can it travel in 1 hour and 5 minutes?

Mark (1)

Q 7 The cost of 5 metres of cloth is Rs 350. Find the cost of 7 metres of cloth.

Mark (1)

Q 8 A 14 metres stick casts a shadow of 10 metres. Find the height of a stick which casts a shadow of 15 metres under similar conditions.

Mark (1)

Q 9 A train is moving with uniform speed of 80 km/hr. How for will it travel in 35 minutes?

Mark (1)

Q 10 18 workers can build a wall in 26 hours, how many workers will be required to do the same work in 13 hours?

Mark (1)

Q 11 There are 100 students in a hostel. The food provision for them is for 15 days. How long will there provision last if 20 more join the group?

Marks (2)

Q 12 12 men can dig a trench in 8 days. How many men can dig the same in 6 days?

Marks (2)

Q 13 A garrison of 500 men had provision for 24 days. However, a reinforcement of 300 men arrived. How long the food will last?

Marks (2)

Q 14 At 60 km/hour a car takes 2 hours to reach its destination. How long will the car take if it travels at a speed of 80 km/hr?

Marks (2)

Q 15 The number of bottles made by a factory in 63 days is 315. How many bottles can it make in 82 days?

Marks (2)

Q 16 A road map with a scale of 1 cm represents 36 km. When Ravi drives on a road for 144 km, what would be the distance covered by him on the map?

Marks (2)

Q 17 If a train is moving at a uniform speed of 75 km/hour, find the time required to cover the distance of 300 km.

Marks (2)

Q 18 A car can finish a journey in 10 hours at the speed of 48 km/hr. By how much should its speed be increased so that it may take only 8 hours to cover the same distance?

Marks (2)

Q 19 Reema types 540 words in half-hour. How many words would she type in 6 minutes?

Marks (2)

Q 20 If 56 men can do a piece of work in 42 days, how many men are required to complete it in 14 days?

Marks (3)

Q 21 The scale of a map is given as 1 : 40000000. Two cities are 4 cm apart on the map. Find the actual distance between them.

Marks (3)

Q 22 12 pipes are required to fill a tank in 2 hours 40 minutes. How long will it take if only 10 pipes of the same type are used?

Marks (3)

Q 23 If a box of sweets is divided among 48 children, they will get 7 sweets each. How many would each get, if the number of the children is reduced by 6?

Marks (3)

Q 24 A batch of bottles were packed in 25 boxes with 12 bottles in each box. If the same batch is packed using 20 bottles in each box, how many boxes would be filled?

Marks (3)

Q 25 A school has 8 periods a day each of 45 minutes duration. How long would each period be, if the school has 9 periods a day, assuming the number of school hours to be same?

Marks (3)

Q 26 120 men had food provision for 195 days.  How long would the food last if there are 90 men?

Marks (3)

Q 27 18 men can reap a field in 35 days. Find the number of men required to reap the same field in 15 days.

Marks (3)

Q 28 Working for 8 hours daily, 40 people can dig the foundation of a building in 21 days. Working for 10 hours daily, if the work is to be finished in 14 days, how many people are needed to do the same work?

Marks (4)

Q 29 6 typists working 5 hours a day can type the manuscript of a book in 16 days. How many days will 4 typists take to do the same job each working 6 hours a day?

Marks (4)

Q 30 A hostel spends Rs. 3200 as cost of rice for 20 students for 30 days. If the hostel spends Rs. 2400 for 30 students, for how many days will the rice last?

Marks (4)


Q 31 A school hostel with 40 children has enough provisions for food to last for 15 days. If 10 children left the hostel, how many days will the provisions last now?

Marks (4)


Q 32 A train can finish a journey in 10 hours, travelling at a speed of 56 km/h. If another faster train is to cover the same journey in 8 hours, what would be the average speed of the new train?

Marks (4)


Q 33 10 men working for 6 days mow an area of 5  acres. If there are 8 men working to mow 4 acres of land, how many days will it take?

Marks (4)


Q 34 A family of 8 people has enough stock of rice to last for 30 days. Due to the arrival of some relatives, this food was consumed in 20 days. How many guests joined the family?

Marks (4)


Q 35 In an army camp, there are 800 soldiers. There is enough food for them for 60 days. If 400 more soldiers arrive at the camp, how many days will the food last?

Marks (4)


## Most Important Questions

Q 1 The variables x and y are in direct proportion, based on this relation fill the table

| x | 12 | $x_2$ | 8 | 15 |
|---|----|-------|---|-----|
| y | 60 | 5 | $y_3$ | $y_4$ |


Q 2 If the cost of 5 pens is Rs.20, what will the cost of 9 such pens?


Q 3 Raja covers a distance of 18 km in 1 hour, how much time will he need to travel a distance of 8 Km.


Q 4 A milk factory can fill 480 bottles in 6 hours. How many bottles will it fill in   3 hours?


Q 5 The scale of a map is given as 1:30000000. Two cities are 4 cm apart on the map. What is the actual distance between them?


Q 6 A car is moving at a uniform speed of 75 km/hr.
How far will it travel in 20 minutes?
Find the time required to cover a distance of 250 km.


Q 7 In the model of a fort, the flag is 9 m high, however the flag of the actual ship is 12 m high. If the height of the actual fort is 28 m what is the height of the model fort.


Q 8 If the weight of 7 bags is 560 kg, what is the weight of 14 such bags?

Q 9 If 18 earrings cost Rs 1,530 what is the cost of 13 such earrings?

Q 10 The variables x and y are in indirect proportion, based on this relation fill the table

| x | 12 | $x_2$ | 8 | 15 |
|---|----|-------|---|----|
| y | 60 | 5 | $y_3$ | $y_4$ |

Q 11 A fort had provisions for food for 300 men over a period of 90 days. After 20 days, 50 men left the fort. How long would the food last at the same rate?

Q 12 A hostel had provisions for 75 students for 30 days. After 6 days, 15 more students come to the hostel. How long will the remaining provisions last at the same rate?

Q 13 6 pipes are required to fill a tank in 1 hour 20 min. How long will it take if only 5 pipes of the same type are used?

Q 14 If 15 workers can build a wall in 48 hours, how many workers will be required to do the same work in 30 hours?

Q 15 If a box of toffees is divided among 24 children, they will get 5 toffees each. How many toffees will each get if the number of children is reduced by 4?

Q 16 A factory of socks requires 42 machines to produce a given number of socks in 63 days, how many machines are required to produce the same number of socks in 54 days?

Q 17 A farmer has enough grains to feed 20 hens for a period of 6 days. How long will the food last if there were 10 more hens with him?

Q 18 A car takes 2 hours to reach a destination by traveling 60 km/hr. How long will it take when the car travels at the speed of 80 km/hr.

# 14. Factorisation

Q 1 Factorise $2x + 4$.

Mark (1)

Q 2 Factorise $12a^2b + 15ab^2$.

Mark (1)

Q 3 Factorise $10x^2 - 14x^3 + 18x^4$

Mark (1)

Q 4 Factorise $20x^2y + 30axy$.

Mark (1)

Q 5 Factorise $x^2 + xy + 8x + 8y$.

Mark (1)

Q 6 Factorise $1 + a + ac + a^2c$.

Mark (1)

Q 7 Factorise $a^2 + bc + ab + ac$.

Mark (1)

Q 8 Factorise $x^2 - 36$ using identity.

Mark (1)

Q 9 Factorise $xy - pq + qy - px$.

Mark (1)

Q 10 Factorise $5a(2x - 3y) + 2b(2x - 3y)$.

Mark (1)

Q 11 Factorise $ax^2 + by^2 + bx^2 + ay^2$.

Marks (2)

Q 12 Factorise $8(4x + 5y)^2 - 12(4x + 5y)$.

Marks (2)

Q 13 Factorise using identity $x^2 + 10x + 25$.

Marks (2)

Q 14 Factorise using identity $4x^2 + 9y^2 + 12xy$.

Marks (2)

Q 15 Factorise $ax^2y + bxy^2 + cxyz$.

Marks (2)

Q 16 Factorise $15xy - 6x + 5y - 2$.

Marks (2)

Q 17 Factorise $6pq - 4q + 6 - 9p$.

Marks (2)

Q 18 Find the factors of $x^2 - 7x + 12$.

Marks (2)

Q 19 Find the factors of $3x^2 + 9x + 6$.

Marks (2)

Q 20 Factorise $(a + b)^2 - (a - b)^2$.

Marks (2)

Q 21 Factorise the expression $10ab + 4a + 5b + 2$.

Marks (3)

Q 22 Divide $24x^2y^2z^2$ by $6yz$.

Marks (3)

Q 23 Divide $(7a^2 + 14a)$ by $(a + 2)$.

Marks (3)

Q 24 Divide $x(5x^2 - 80)$ by $5x(x + 4)$.

Marks (3)

Q 25 Divide $x^2 + 7x + 10$ by $x + 5$.

Marks (3)

Q 26 Divide $12pq(9p^2 - 16q^2) \div 4pq(3p + 4q)$.

Marks (5)

Q 27 Divide $39x^3(50x^2 - 98)$ by $26x^2(5x + 7)$.

Marks (5)

Q 28 Find the factors of $25x^2 - 4y^2 + 28yz - 49z^2$.

Marks (5)

Most Important Questions

Q 1 Add $4x^2 + 2xy - 4$ & $7x^2 - 3xy + 4$.

Q 2 Subtract $7x - 3x^2$ from $4x + 8x^2$.

Q 3 Find the product of (7x - 4y) and (3x - 7y).

Q 4 Using suitable identity find (7x - 3y)².

Q 5 Using identity $(a - b)^2 = a^2 - 2ab + b^2$ find the value of $98^2$.

Q 6 Subtract $3x(x - 4y + 5z)$ from $4x(2x - 3y + 10z)$.

Q 7 Multiply $\left(a^2 + 2c^2\right)(3a - 3c)$

Q 8 Using suitable identity find $\left(6x^2 - 5/3\right)^2$.

Q 9 Simplify $(xy + yz)^2 - (xy - yz)^2$.

Q 10 Using identity find the product of $\left(\dfrac{a}{2} + \dfrac{3b}{4}\right)\left(\dfrac{a}{2} + \dfrac{3b}{4}\right)$.

Q 11 If $x + \dfrac{1}{x} = 6$, find $x^2 + \dfrac{1}{x^2}$

Q 12 Find the product of $\left(\dfrac{5}{3}x + \dfrac{3}{4}y\right)^2 - \left(\dfrac{5}{3}x + \dfrac{3}{4}y\right)^2$ and also evaluate it when $x = +2$ and $y = -1$

Q 13 Using identity $a^2 - b^2 = (a + b)(a - b)$ find $(1.02)^2 - (0.98)^2$

Q 14 If $x + y = 12$ and $xy = 32$. Find the value of $x^2 + y^2$.

Q 15

Simplify $(xy + yz)^2 - 2x^2y^2z$ find the value when x = -1, y = 1 and z = 2

Subtract

Q 16 $4x^2 - 2y + 7z^3 - 3$ from $3y + 7x^2 - 2z^3 + 4$

Q 17 Divide $-72x^2yz$ by $-12xyz$

Q 18 Divide $9m^5 + 12m^4 - 6m^2$ by $3m^2$

Q 19 Divide $\frac{2}{3}a^2b^2c^2 + \frac{4}{3}ab^2c^3 - \frac{1}{5}ab^3c^2$ by $\frac{1}{2}abc$

Q 20 Divide $6 + x - 4x^2 + x^3$ by x - 3 by long division method.

Divide $12x^3 - 8x^2 - 6x + 10$ by 3x - 2 Write the

Q 21 quotient and the remainder.

Q 22 Divide $x^3 - 6x^2 + 11x - 6$ by $x^2 - 4x + 3$.

Q 23 Find whether x + 1 is factor of $2x^2 + 5x + 4$ or not.

Q 24 Divide the following $63a^2b^4c$ by $7a^2b^2c$.

Divide the polynomial $5x(x^2 - x + 1) - (9 + 4x^4)$ by 4x - 1.
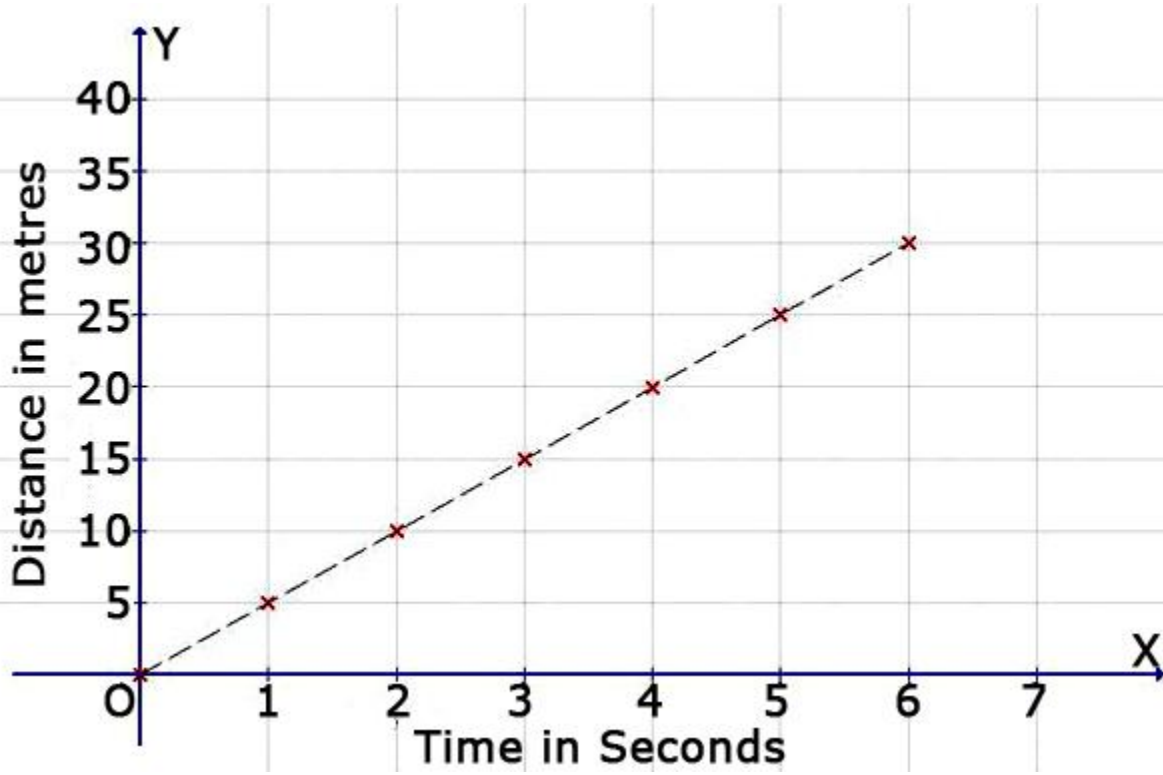
Q 25 Write quotient and remainder.

Divide the polynomial $x^3 + 3x^2 - 5x + 4$ by x - 1.

Q 26 Write quotient and remainder.

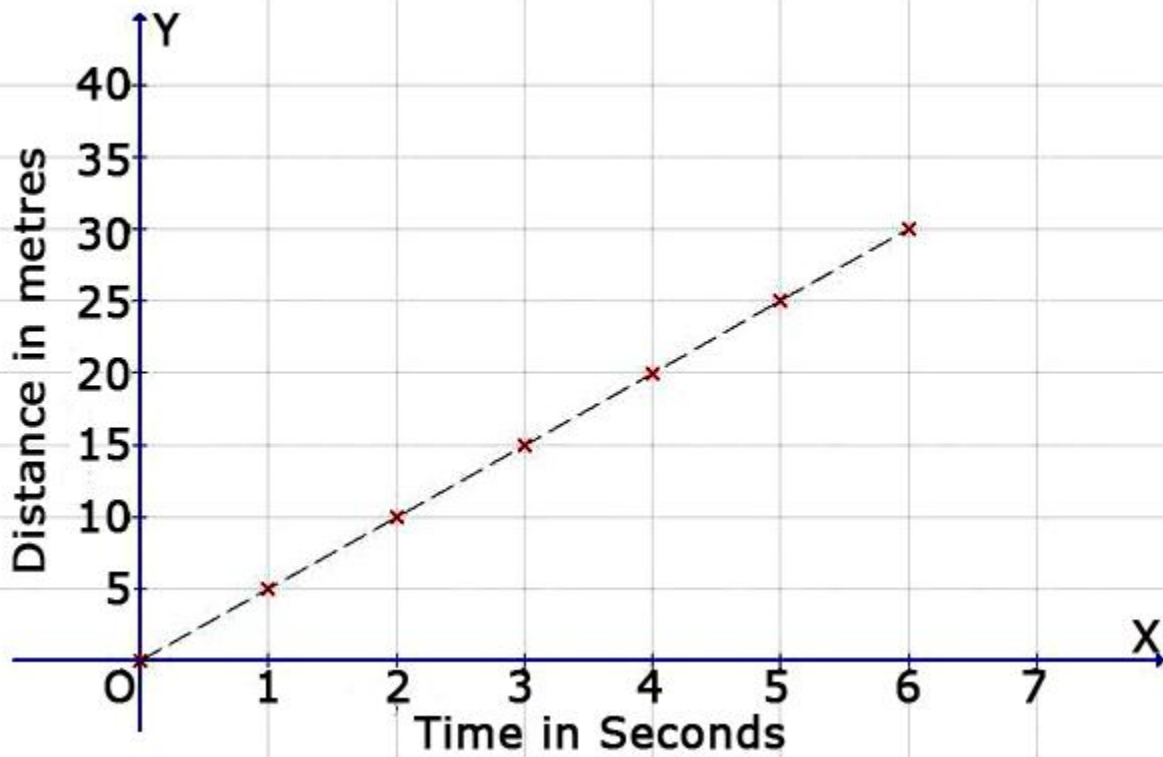Q 27 Divide $z(5z^2 - 80)$ by 5z(z + 4).

# 15.   Introduction to Graphs

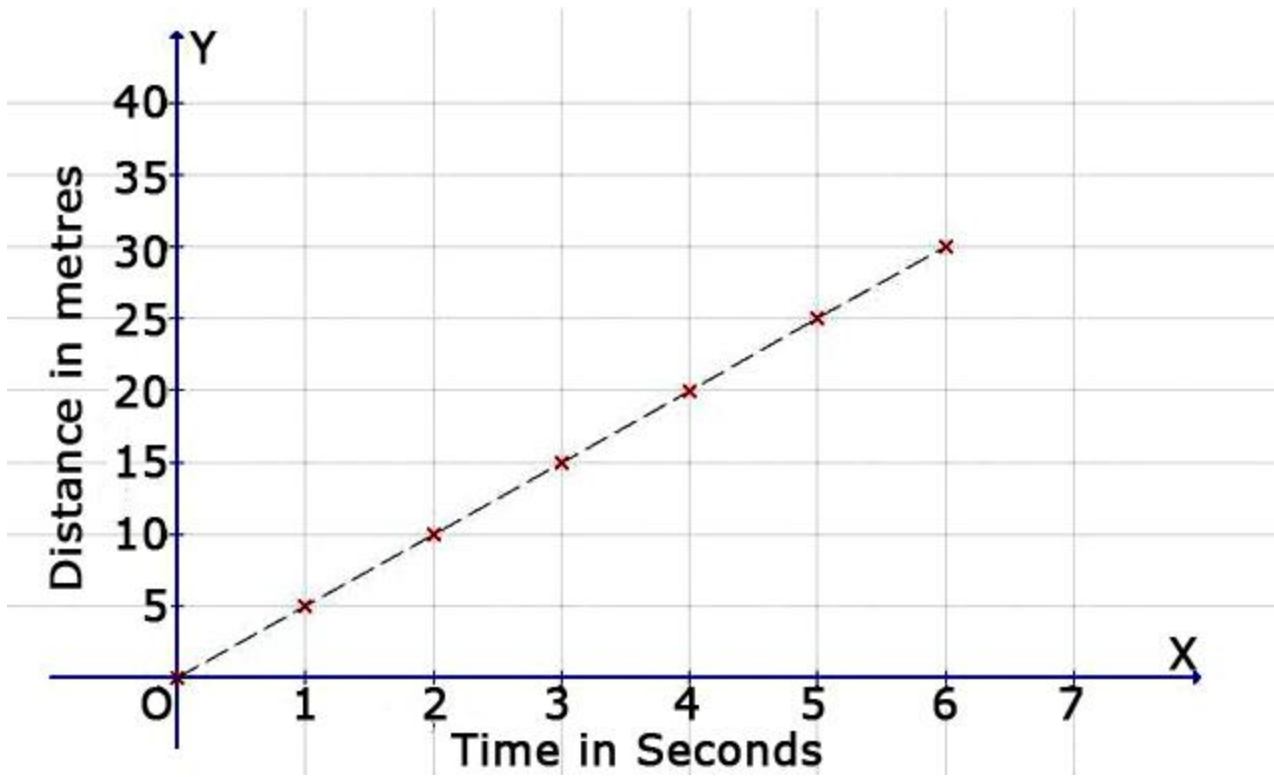Q 1 Find the distance covered in 3 seconds.



Mark (1)

Q 2 Find the distance covered in 5 seconds.



Mark (1)

Q 3 Find the time taken by a body to cover 30 metres.



Mark (1)

Q 4 In which quadrant does the point P(-4, 1) lie?

Mark (1)

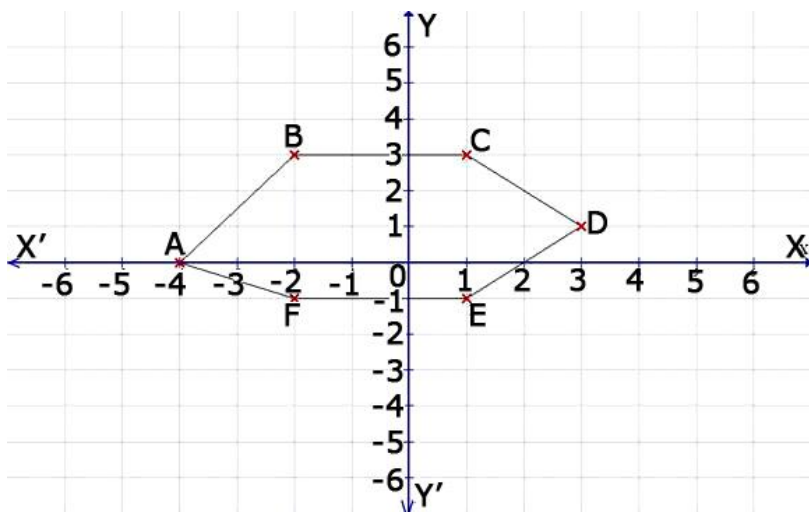Q 5 In which quadrant does the point Q(-2, -6) lie?

Mark (1)

Q 6 On which axis does the point (0, 5) lie?

Mark (1)

Q 7 Write the coordinate of point shown in cartesian plane.
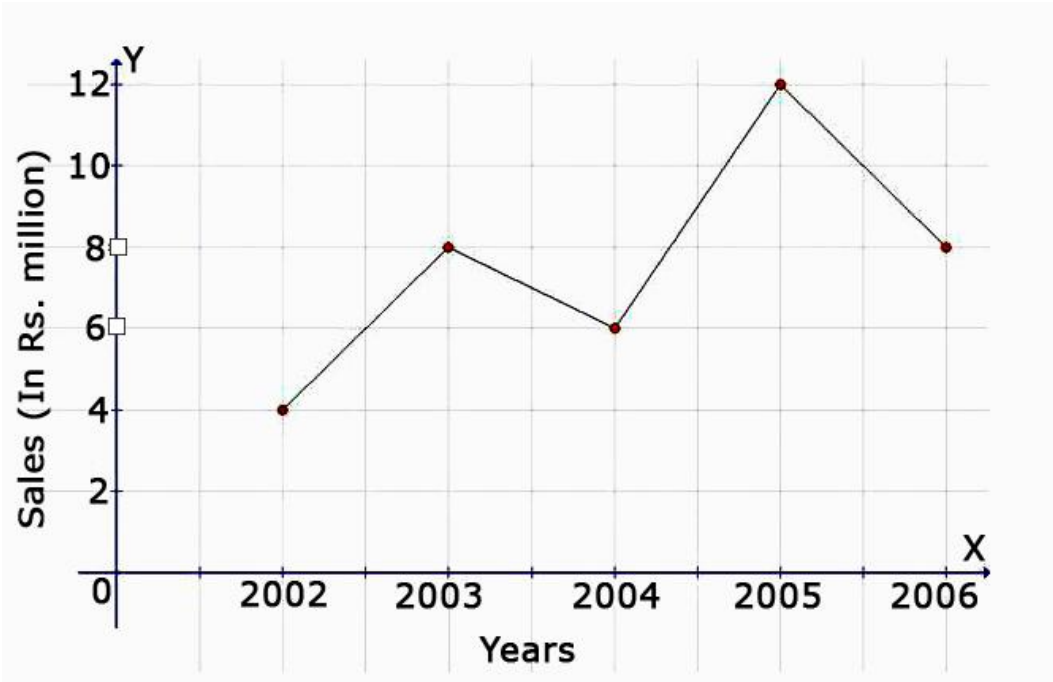
Mark (1)

Q 8 Find the coordinates of the points A, B, C, D, E and F from the graph.



Marks (2)

Q 9 The line graph shows the yearly sales figure for a manufacturing company. From the graph, what were the sales in 2004 and 2006?
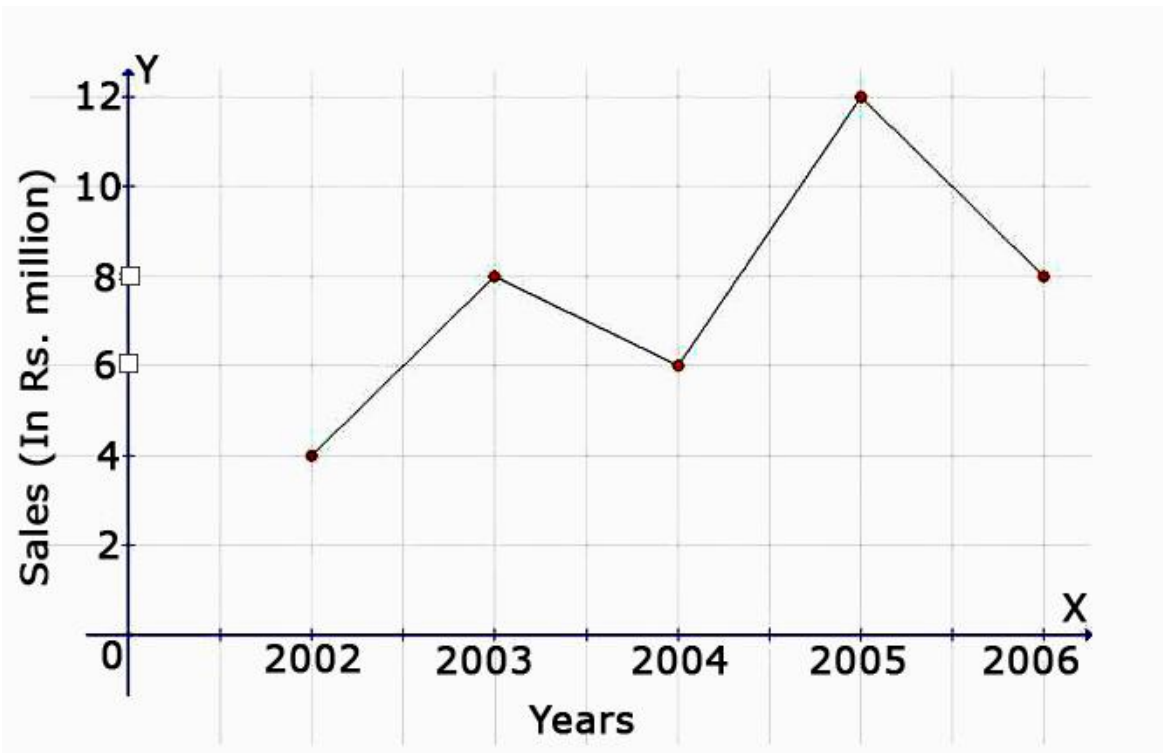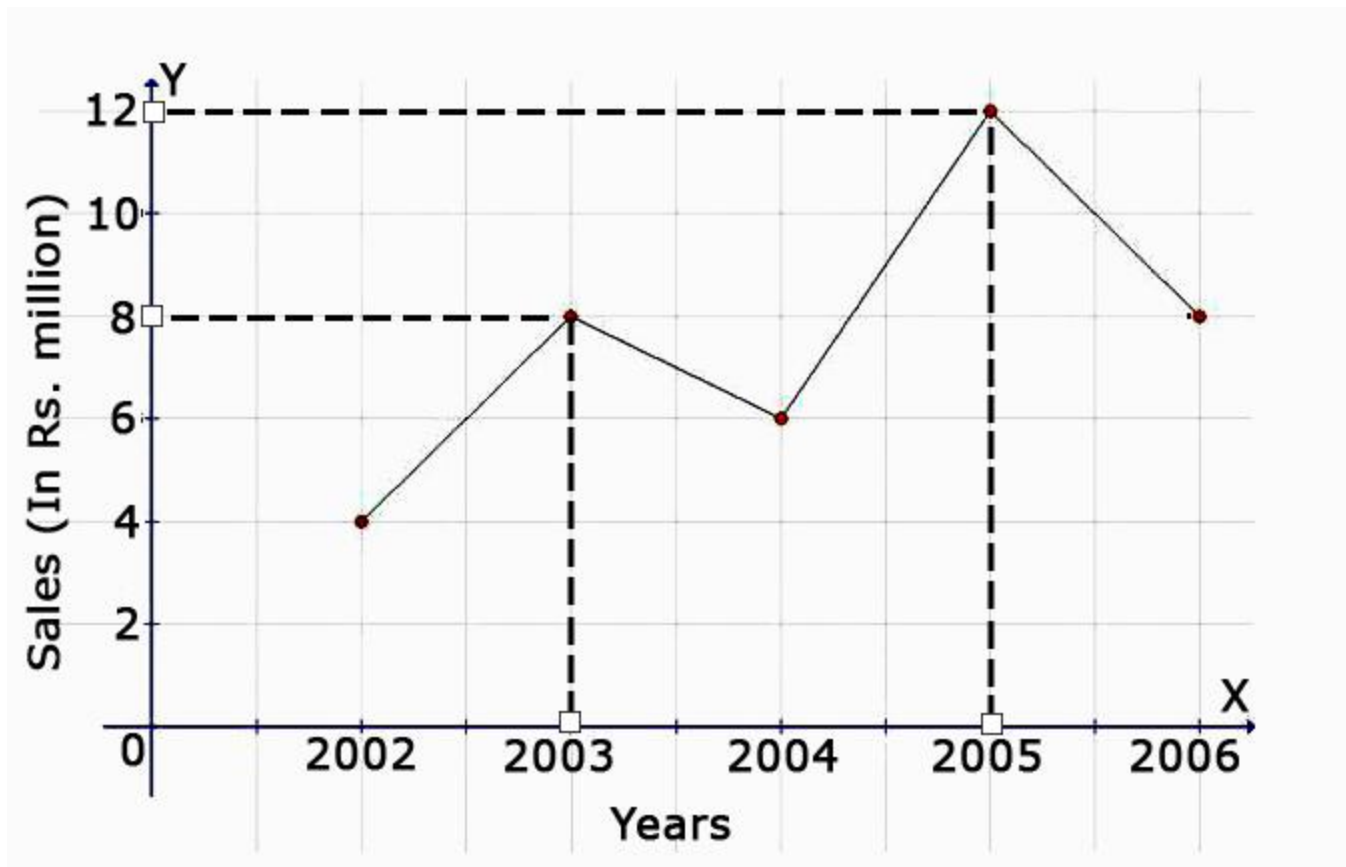


Marks (2)

Q 10 The line graph given shows the yearly sales figure for a manufacturing company. From the graph, what were the sales in 2003 and 2005?
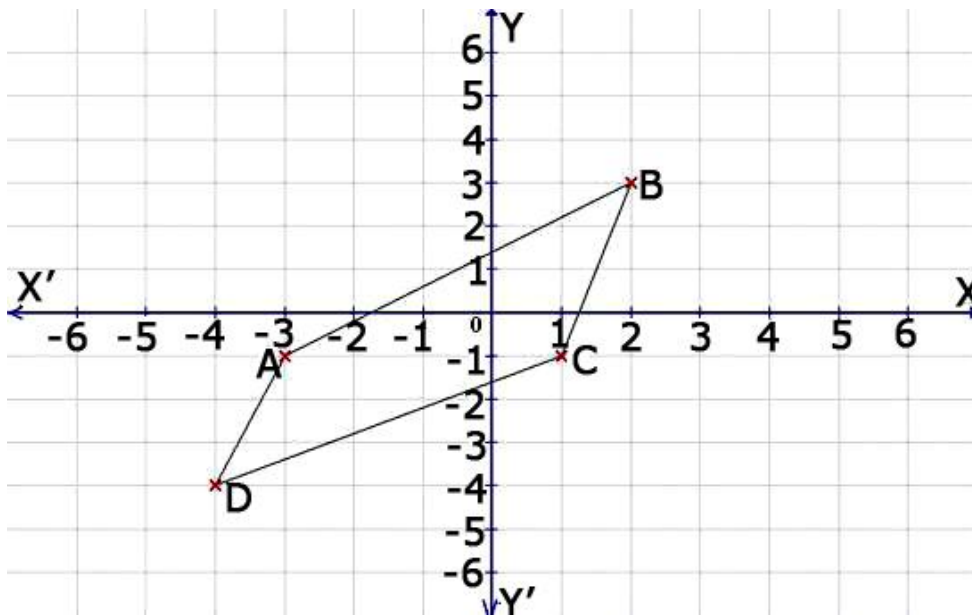


Marks (2)

Q 11 From the given graph, compute the difference between the sales 2003 and 2005.



Marks (2)

Q 12 From the graph write the coordinates of the A, B, C and D.



Marks (2)

Q 13 Plot the following points on a graph.
A(4, 3), B(2, 6) C(-2, -3), D (-3, 5)

Marks (2)

Q 14 Draw a graph for the following.

| Distance in metres | 5 | 10 | 15 | 20 | 25 | 30 |
|---|---|---|---|---|---|---|
| Time in seconds | 1 | 2 | 3 | 4 | 5 | 6 |

Is it a linear graph?

Marks (2)

Q 15 Make a table of values for the function P = 4a, where P is the perimeter and a is side of the square.

Marks (2)

Q 16 Plot the following points. Verify if they lie on a line.
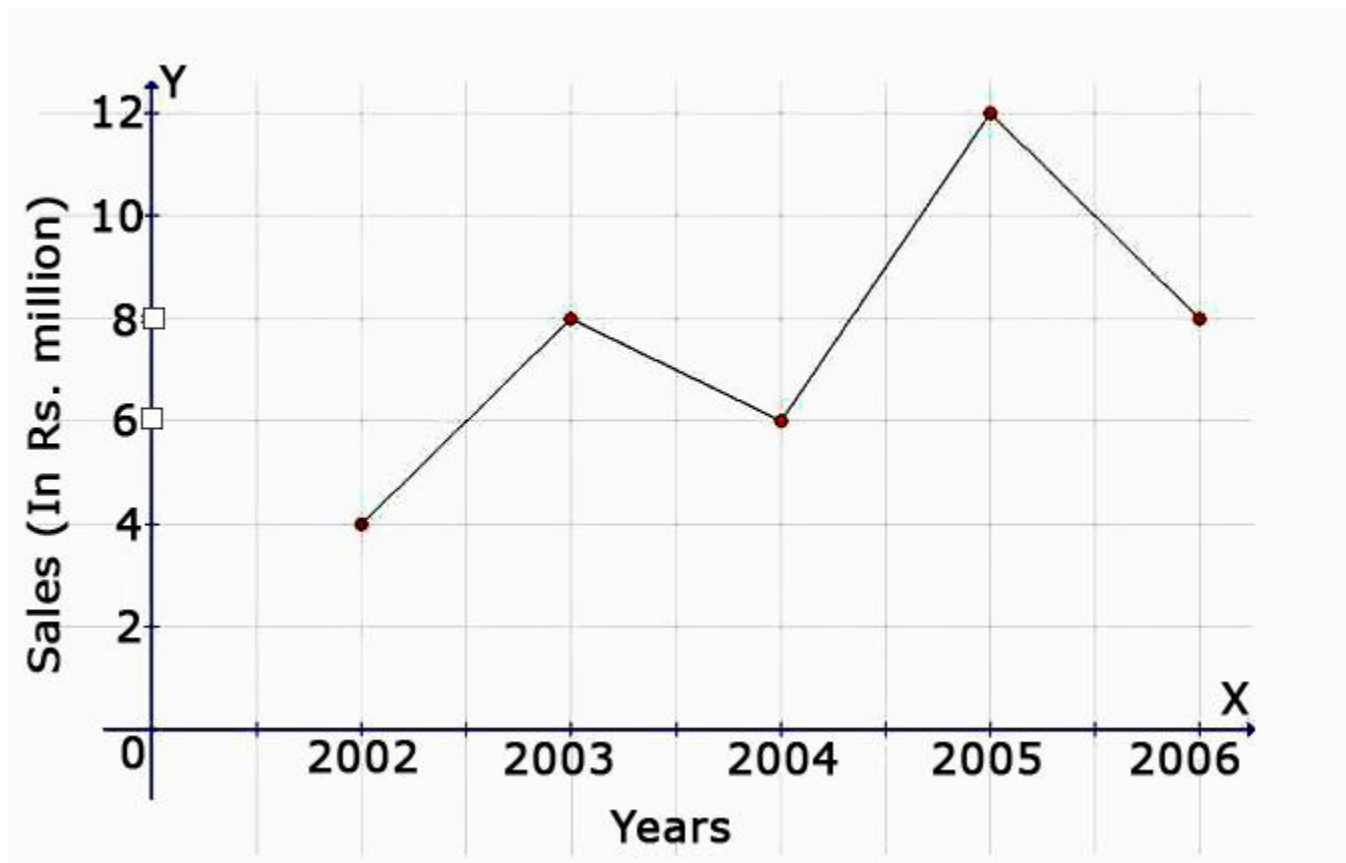(1, 3), (2, 3), (3, 3), (4, 3)

Marks (2)

Q 17 Draw the line passing through (2, 3) and (3, 2). Find the coordinates of the points at which this line meets the x-axis and y-axis.

Marks (2)

Q 18 In which year was there the greatest difference between the sales as compared to its previous year?



Marks (3)

Q 19 Make a table of values for the function y = 3x. From the table find the values of y when x = 4 and x = 5.

Marks (3)

Q 20 Reena deposited Rs. 12000 in a bank at the rate of 10% per annum. Draw a linear graph showing the relationship between the time and simple interest. Also, find the simple interest for 4 years.

Marks (4)

Q 21

A train is moving at a constant speed of 75
    km/h. Draw a distance – time graph.
    (i) How far will it travel in 2 hours 30 minutes?
    (ii) Find the time required to cover a distance of
        300 km.

Marks (4)

Q 22

A bank gives 10% simple interest on savings
    account. Draw a linear graph to show the
    relationship between the sum deposited and
    simple interest earned. Also, answer the
    following questions:

    (a) Find the interest earned on an investment of
        Rs. 300.

    (b) What investment should be made to earn
        Rs.70 as interest?

Marks (4)

Q 23 Mayank deposited Rs. 1400 in a bank at the
    rate of 10% per annum. Draw a linear graph
    which shows the relationship between time
    and the interest earned by Mayank.

Marks (4)

Q 24 If $y = x^2$, then draw a graph.

Marks (4)

Q 25 Parul is driving a car constantly at a speed of 30 km/h. Draw a distance-time graph in this case. Also, find the time taken by Parul to cover a distance of 120 km.

Marks (4)

Q 26 Draw the graph for the following table of values.

Interest on deposits for a year.

| Deposit in Rs | 1000 | 2000 | 3000 | 4000 | 5000 |
|---|---|---|---|---|---|
| Interest in Rs | 60 | 120 | 180 | 240 | 300 |

(1) Use the graph to find the interest on a deposit of Rs 4500 for a year.
(2) To get an interest of Rs 420, how much money should be deposited?
(3) Does the graph pass through origin?

Marks (5)

Q 27 Draw the graph for a function $A = x^2$ (Area of a square = $side^2$). Make a table when the side of a square is 2 cm, 3 cm, 4 cm, 5 cm, 6 cm and 7 cm. Is it a linear graph?

Marks (5)

Most Important Questions

Q 1 State true or false 1) A point whose x coordinate is zero and y coordinate is non-zero will lie on the y-axis. 2) The coordinates of the origin are (0,0). 3) A point whose y coordinate is zero and x coordinate is 4 will lie on y axis.

Q 2 The approximate speeds of some objects are given below. Draw a bar graph to represent them.

| Name of objects | Bicycle | Scooter | Car | Bus | Train |
|---|---|---|---|---|---|
| Speed (in km/hr) | 10 | 40 | 60 | 50 | 80 |

Q 3 Hundred students from a certain locality use different modes of traveling to school as given below. Draw a bar graph.

| Bus | Car | Rickshaw | Bicycle | Walk |
|---|---|---|---|---|
| 32 | 16 | 24 | 20 | 8 |

Q 4 The approximate speeds of some objects are given below. Draw a pie-chart.

| Name of objects | Bicycle | Scooter | Car | Bus | Train |
|---|---|---|---|---|---|
| Speed (in km/hr) | 10 | 40 | 60 | 50 | 80 |

Q 5 Mr. Mirza's monthly income is Rs 7,200. He spends Rs 1,800 on rent, Rs. 2,700 on food, Rs 900 on education of his children, Rs 1,200 on others and saves the rest.
Draw a pie-chart to represent it.

Q 6 In a class of 40 students, the marks obtained (out of 50) are as given below:

| Marks | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 |
|---|---|---|---|---|---|
| No. of students (frequency) | 5 | 10 | 12 | 8 | 5 |

Draw a histogram to represent the given data.

Q 7 Draw the histogram to represent the following data:

| Class-Interval | 50-60 | 60-70 | 70-80 | 80-90 |
|---|---|---|---|---|
| Frequency | 20 | 30 | 25 | 10 |

Q 8 The following table gives the marks scored by 100 students in an entrance examination.

| Mark | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
|---|---|---|---|---|---|---|---|---|
| No. of students (frequency) | 4 | 10 | 16 | 22 | 20 | 18 | 8 | 2 |

Represent this data in the form of a histogram.

Q 9 The percentage of marks obtained, in different subjects by Ashok Sharma (in an examination) are given below. Draw a bar graph to represent it.

| English | Hindi | Maths | Science | Social Science |
|---------|-------|-------|---------|----------------|
| 85 | 60 | 35 | 50 | 70 |

Q 10 The following table shows the market position of different brand of tea-leaves.
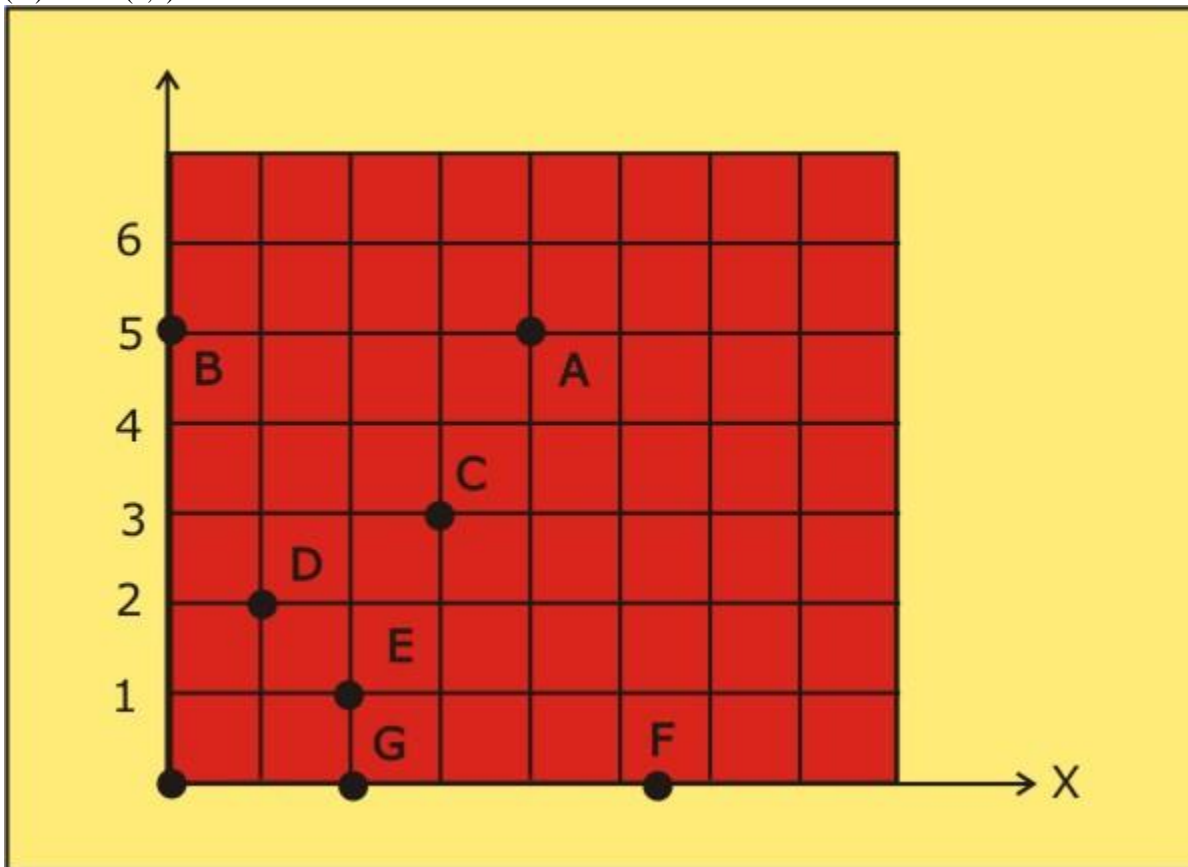Draw a pie-chart to represent this information.

| Brand | A | B | C | D | E |
|-------|---|---|---|---|---|
| % Buyers | 35 | 20 | 20 | 15 | 10 |

Q 11 Draw a histogram to represent:

| Age (in years) | 20-28 | 28-36 | 36-44 | 44-52 | 52-60 | 60-68 |
|----------------|-------|-------|-------|-------|-------|-------|
| No. of pupils | 14 | 18 | 16 | 24 | 10 | 20 |

Q 12 Choose the letters that indicate the location of the points given below:
(i)        (4,5)
(ii)       (3,3)
(iii)      (2,1)



Q 13 Plot the following points and verify if they lie on a line. If they lie on a line,Name it.
(i)        (0,2), (0,5), (0,6) (0,3.5)
(ii)       W(2,6), X(3,5), Y(5,3), Z(6,2)

Q 14 State whether true or false. Correct the ones that are false.
(i)        A point whose x co-ordinate is 1 and y co-ordinate is 10 will lie on the y-axis.
(ii)       A point whose y co-ordinate is -2  and x co-ordinate is - 5 will lie in the third quadrant .
(iii)      The co-ordinates of the origin are (0,0).

Q 15 The following table gives the quantity of diesel and its cost. Plot a graph to show the data.

| No. of liters of diesel | 10 | 15 | 20 | 25 |
|---|---|---|---|---|
| Cost of diesel in Rs | 500 | 750 | 1000 | 1250 |

Q 16 Ajit can ride a scooter constantly at a speed of 30 km/hr. Draw a distance-time graph for this situation. Use this information to find:
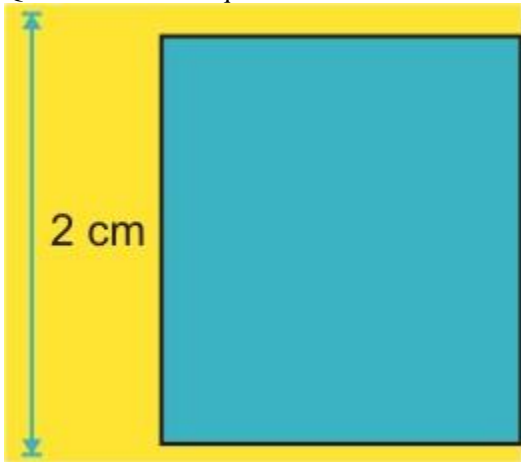(i)  The time taken by Ajit to ride 75 km.
(ii) The distance covered by Ajit in 3 ½  hours.

Q 17 On a set of co-ordinate axes, plot the points
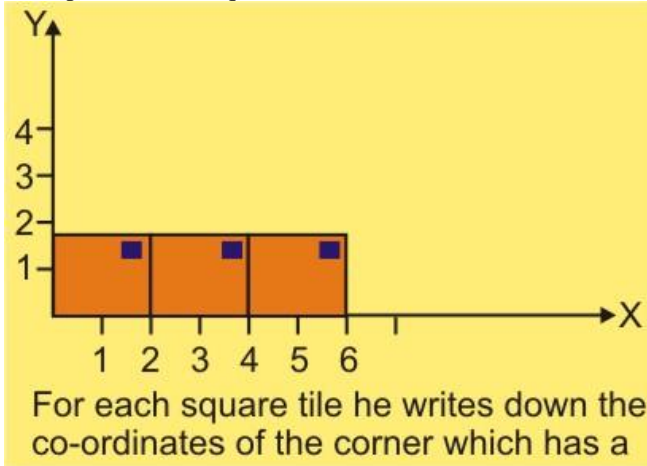A(2,3), B(0,4), C(-2,3), D(-1, -2), E(-3,0), F(2,-4)

Q 18 Identify the coordinates of the points A, B, C, D, E, F, G  shown on the following grid:
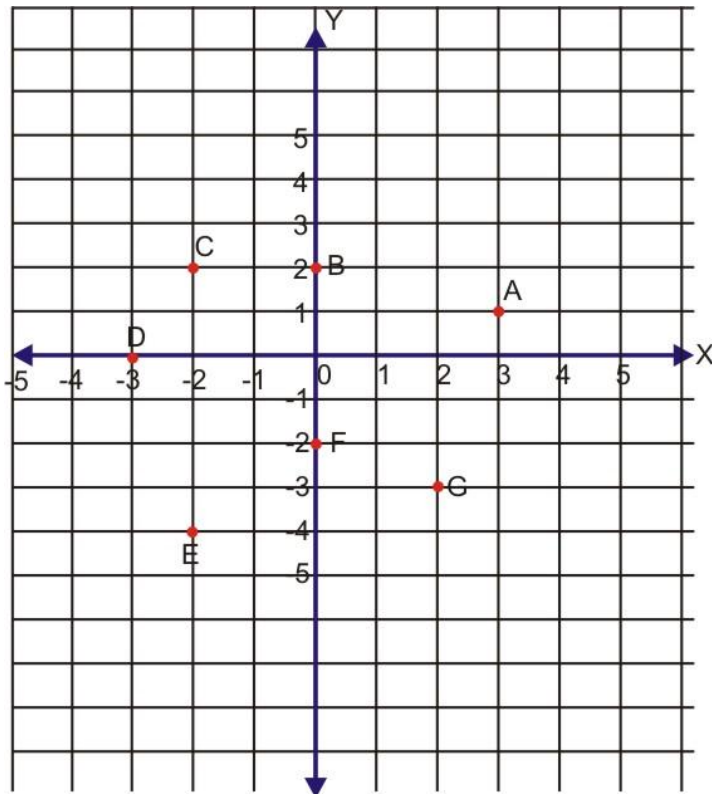
Q 19 Marc has ten square tiles this:



2 cm

Marc places all the square tiles in a row. He starts his row like this:



For each square tile he writes down the co-ordinates of the corner which has a

The co-ordinates of the first corner are (2,2).
(a)  Write down the co-ordinates of the next five corners which have a*
(b)  Look at the numbers in the co-ordinates. Describe two things you notice.
(c)  Marc thinks that (17,2) are the coordinates of one of the corners which have a*. Explain why he is wrong.
(d)  Sam has some bigger square tiles, like this:



3 cm
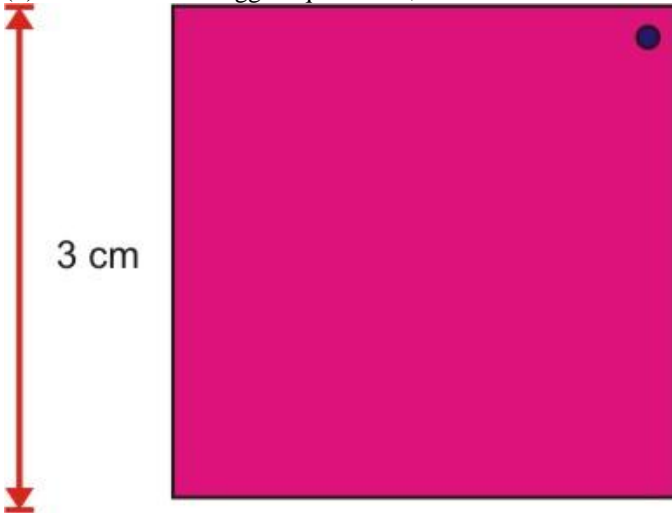
She places them next to each other in a row, like Marc's tiles.
Write down the coordinates of the first two corners which have a*.

Q 20 A bank gives 10% Simple Interest (S.I.) on deposits by senior citizens. Draw a graph to illustrate the relation between the sum deposited and simple interest earned. Find from
your graph
(a) The annual interest obtainable for an investment of Rs 250.
(b) the investment one has to make to get an annual simple interest of Rs 70.

# 16.   Playing with Numbers

Q 1 When $N \div 5$ leaves a remainder of 2, find the one's digit of N.

Mark (1)

Q 2 Find the generalised form of 206.

Mark (1)

Q 3 Write the generalised form of a three digit number 'abc'.

Mark (1)

Q 4

Find the value of A in the addition.

```
  41A
+ 1A4
 ─────
  591
```

Mark (1)

Q 5 If the division $N \div 5$ leaves a remainder of 1, what will be the ones digits of N?

Mark (1)

Q 6 When $N \div 2$ leaves a remainder of 1, what will be the one's digit of N?

Mark (1)

Q 7 What will be the unit's digit of N if it is divisible by 5 exactly?

Mark (1)

Q 8 Check the divisibility of 2147681 by 3.

Mark (1)

Q 9 If 15Z7 is a multiple of 3 where 'Z' is a digit, find the value of Z.

Mark (1)

Q 10 Find the value of Q in the multiplication.

```
  1 Q
× 　Q
─────
  9 Q
```

Marks (2)

Q 11 Find the values of P and Q in the addition.

```
    3  Q
 +  2  5
 ─────────
    P  2
```

Marks (2)

Q 12 The ones digit of a two-digit number is 3 and the sum of digits is 1/7 of the number itself. What is the number?

Marks (2)

Q 13 Find A and B in the addition.

```
    3  2  A
 +  1  A  B
 ──────────
    A  6  7
```

Marks (2)

Q 14 If $42x$ is a multiple of 3 (where $x$ is a digit), find the value of $x$.

Marks (2)

Q 15 If $51x3$ is a multiple of 9 (where $x$ is a digit), find the value of $x$.

Marks (2)

Q 16 Find 'a' such that the five digit number 91a92 is divisible by 9.

Marks (2)

Q 17 Find a number whose cube is equal to the number itself but its square is not equal to the number itself.

Marks (2)

Q 18 Find two numbers whose product is a one digit number and sum is a two digit number .

Marks (2)

Q 19 A two digit number exceeds the sum of the digits of that number by 18. If the digits at the unit's place is double the digit in the ten's place, find the number.

Marks (3)
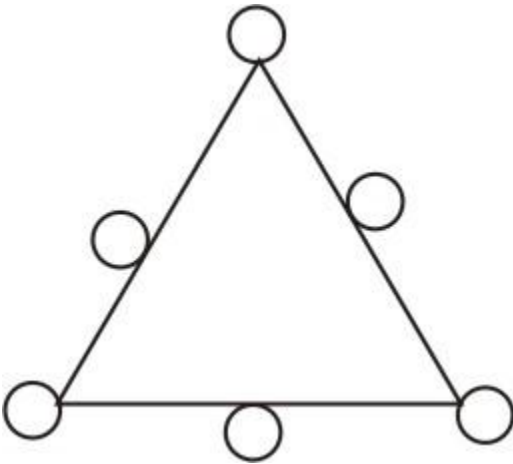
Q 20 Find  A, B, C in the addition.

```
    3  4  A
 +  3  A  B
 ──────────
    C  2  9
```

Marks (3)

Q 21 In a two digit number the digit in the one's place is three times the digit in the ten's place and the sum of the digits is equal to 12. What is the number?

Marks (3)

Q 22 Fill in the numbers from 7 to 12 (without repetition) so that each side of the given magic triangle adds up to 30.



Marks (3)

Q 23 The difference between a two digit number and the number obtained by interchanging its digits is 63. What is the difference between the two digits of the number?

Marks (3)

Q 24 Find the values of A and B.

```
    A  B
 ×  A  3
 ─────────
 5  7  B
```

Marks (4)

Q 25 Find the values of A, B and C in the multiplication.

```
   A  B
 ×    5
 ────────
 C  A  B
```

Marks (4)

Q 26 If the following three digit numbers are divisible by 3,
(i) 223x4  (ii) 4543x  (iii) 2562x1  (iv) 3495x
then what is the value of x?

Marks (4)

Q 27 Check the divisibility of the following numbers by 9.
(i) 72163458, (ii) 23457891,
(iii) 12304905, (iv)30458091

Marks (4)

Q 28 If the following three digit numbers are divisible by 9,
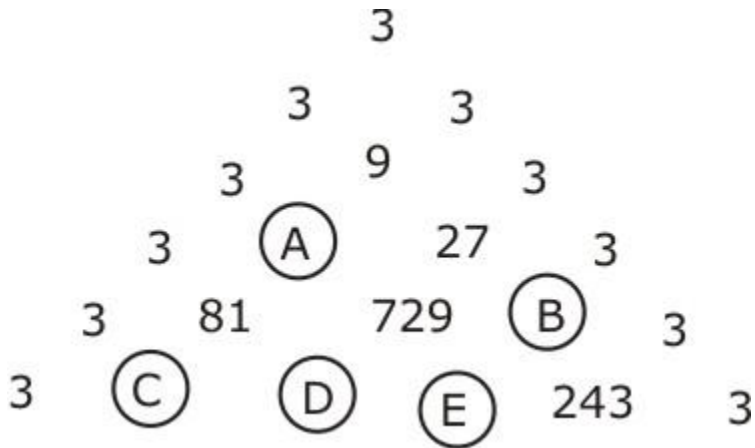(i) 23x4 (ii) 543x (iii) 62x1 (iv) 23495x
then what will be the value of x?

Marks (4)

Q 29 In the given triangle, fill in the numbers from 0 to 8 (without repetition) in the circles so that the numbers on each side of a triangle add up to 13.
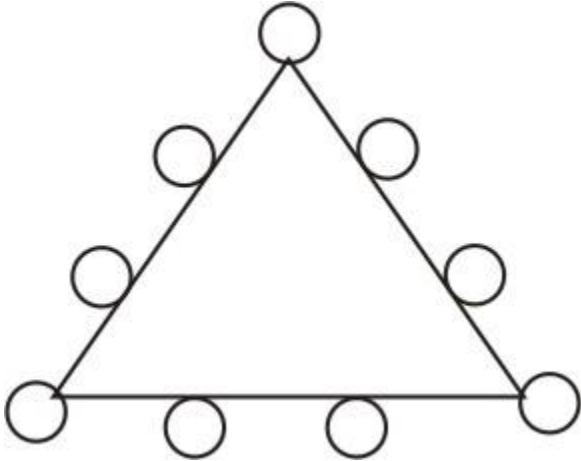
Marks (5)

Q 30 Find the value of A, B, C, D and E to complete the number triangle given below.

```
                    3
              3           3
          3         9         3
       3      (A)       27      3
    3     81       729   (B)   3
  3   (C)     (D)   (E)   243    3
```

Marks (5)

Q 31 In the following, replace A, B, C, D and E by digits to conclude the procedure of division.

```
      B1E
  9)37A2
    36
    16
     C
    D2
    72
     X
```

Marks (5)

Q 1 Check the divisibility of 1052896 by 9.

Q 2 Check the divisibility of 7894561 by 3.

Q 3 Write the following numbers in generalized form :
   a.) 56
   b.) 890
   c.) 25
   d.) 722

Q 4 If 31y5 is a multiple of 3, where y is a digit, what might be the values of y?

Q 5 Write the following numbers in the usual form :
   a.) 4 x 10 + 3
   b.) 2 x 100 + 9 x 10 + 6

   c. ) 3 x 1000 + 6 x 100 + 0 x 10 + 9

Q 6 Write the following numbers in generalized form :
   a.) 22
   b.) 753
   c.) 30
   d.) 861

Q 7 Fill in the blanks :
   a.) 5 x 10 + 9 = _____
   b.) 6 x 1000 + 1 x 100 + 8 x 10 + 7 = _____

   c.) 7 x 100 + 4 x 10 + 8 = = _____

Q 8    Write the smallest digit for z so that the following numbers are divisible
by 3:
   a)  56z89
   b) 89z
Q 9    Without division state whether the given number is divisible by 2:
a) 14567
b) 2248
Q 10    Check whether  the given number is divisible by 6 or not,
a) 2543
b) 3984
Q 11 Ani and Preeti play a game with numbers. Ani asks Preeti to choose a two-digit number and then to reverse the digits of the number. He then asks her to add both the numbers and divide the answer by 11. Ani guarantees that there will be  no remainder. What was the logic behind his guarantee?
Q 12 Pranay asks Shruti to choose a three-digit number. He then asks her to  form two more 3-digit numbers keeping the order of digits same i.e. either clockwise or anti-clockwise. He then asks her to add them up and then divide the resulting answer by 37.  He guarantees that there will be no remainder.
What was the logic behind his guarantee?
Q 13 Find A, B and C in the following :

```
  A B
x   3
_____
C A B
_____
```

Q 14 Find A and B in the addition :

```
        A
      + A
      + A
  _____
       B A
  _____
```

Q 15 Find Q in the addition.

```
        3 1 Q
      + 1 Q 3
      _____
        5 0 1
      _____
```

Q 16 Find E in the addition.

```
      1  E
    x    E
    _____
    9  E
    _____
```

Q 17 Find A, B , C  in the addition.

```
        4  C
      + 9  8
    _____
      A B  3
    _____
```