

Verbal Problems Involving Fractions

3

DIAGNOSTIC TEST

Directions: Work out each problem. Circle the letter that appears before your answer.

Answers are at the end of the chapter.

- On Monday evening, Channel 2 scheduled 2 hours of situation comedy, 1 hour of news, and 3 hours of movies. What part of the evening's programming was devoted to situation comedy?
 - $\frac{1}{3}$
 - $\frac{2}{3}$
 - $\frac{1}{2}$
 - $\frac{1}{6}$
 - $\frac{2}{5}$
- What part of a gallon is 2 qt. 1 pt.?
 - $\frac{3}{4}$
 - $\frac{3}{10}$
 - $\frac{1}{2}$
 - $\frac{5}{8}$
 - $\frac{3}{8}$
- Michelle spent $\frac{1}{2}$ of her summer vacation at camp, $\frac{1}{5}$ of her vacation babysitting, and $\frac{1}{4}$ visiting her grandmother. What part of her vacation was left to relax at home?
 - $\frac{1}{5}$
 - $\frac{1}{20}$
 - $\frac{1}{3}$
 - $\frac{3}{20}$
 - $\frac{1}{6}$
- After doing $\frac{1}{3}$ of the family laundry before breakfast, Mrs. Strauss did $\frac{3}{4}$ of the remainder before lunch. What part of the laundry was left for the afternoon?
 - $\frac{1}{2}$
 - $\frac{1}{4}$
 - $\frac{2}{3}$
 - $\frac{1}{5}$
 - $\frac{1}{6}$

5. Glenn spent $\frac{2}{5}$ of his allowance on a hit record. He then spent $\frac{2}{3}$ of the remainder on a gift. What part of his allowance did he have left?
- (A) $\frac{1}{5}$
(B) $\frac{1}{3}$
(C) $\frac{2}{5}$
(D) $\frac{3}{20}$
(E) $\frac{1}{10}$
6. Barbara's car has a gasoline tank that holds 20 gallons. When her gauge reads $\frac{1}{4}$ full, how many gallons are needed to fill the tank?
- (A) 5
(B) 10
(C) 15
(D) 12
(E) 16
7. 42 seniors voted to hold the prom at the Copacabana. This represents $\frac{2}{9}$ of the senior class. How many seniors did not vote for the Copacabana?
- (A) 147
(B) 101
(C) 189
(D) 105
(E) 126
8. Steve needs M hours to mow the lawn. After working for X hours, what part of the job remains to be done?
- (A) $\frac{M-X}{M}$
(B) $M - \frac{X}{M}$
(C) $M - X$
(D) $X - M$
(E) $\frac{X}{M}$
9. Of D dogs in Mrs. Pace's kennel, $\frac{1}{3}$ are classified as large dogs and $\frac{1}{4}$ of the remainder are classified as medium-sized. How many of the dogs are classified as small?
- (A) $\frac{1}{2}D$
(B) $\frac{1}{6}D$
(C) $\frac{5}{6}D$
(D) $\frac{2}{3}D$
(E) $\frac{1}{3}D$
10. A bookshelf contains A autobiographies and B biographies. What part of these books are biographies?
- (A) $\frac{B}{A}$
(B) $\frac{B}{A+B}$
(C) $\frac{A}{A} + B$
(D) $\frac{A}{B}$
(E) $\frac{B}{A} - B$

1. PART OF A WHOLE

A fraction represents a part of a whole. In dealing with fractional problems, we are usually dealing with a part of a quantity.

Example:

Andrea and Danny ran for president of the Math Club. Andrea got 15 votes, while Danny got the other 10. What part of the votes did Andrea receive?

Solution:

Andrea got 15 votes out of 25. That is $\frac{15}{25}$ or $\frac{3}{5}$ of the votes.

Exercise 1

Work out each problem. Circle the letter that appears before your answer.

1. In a class there are 18 boys and 12 girls. What part of the class is girls?
 - (A) $\frac{2}{3}$
 - (B) $\frac{3}{5}$
 - (C) $\frac{2}{5}$
 - (D) $\frac{1}{15}$
 - (E) $\frac{3}{2}$
2. A team played 40 games and lost 6. What part of the games played did it win?
 - (A) $\frac{3}{20}$
 - (B) $\frac{3}{17}$
 - (C) $\frac{14}{17}$
 - (D) $\frac{17}{20}$
 - (E) $\frac{7}{8}$
3. What part of an hour elapses between 3:45 p.m. and 4:09 p.m.?
 - (A) $\frac{6}{25}$
 - (B) $\frac{2}{5}$
 - (C) $\frac{5}{12}$
 - (D) $\frac{1}{24}$
 - (E) 24
4. A camp employs 4 men, 6 women, 12 girls, and 8 boys. In the middle of the summer, 3 girls are fired and replaced by women. What part of the staff is then made up of women?
 - (A) $\frac{1}{5}$
 - (B) $\frac{2}{9}$
 - (C) $\frac{1}{3}$
 - (D) $\frac{3}{10}$
 - (E) $\frac{1}{2}$

5. There are three times as many seniors as juniors at a high school Junior-Senior dance. What part of the students present are juniors?
- (A) $\frac{2}{5}$
(B) $\frac{3}{5}$
(C) $\frac{2}{3}$
(D) $\frac{3}{4}$
(E) $\frac{1}{4}$
6. What part of a yard is 1 ft. 3 in.?
- (A) $\frac{5}{12}$
(B) $\frac{1}{3}$
(C) $\frac{1}{2}$
(D) $\frac{5}{8}$
(E) $\frac{4}{9}$
7. Manorville High had a meeting of the Student Senate, which was attended by 10 freshmen, 8 sophomores, 15 juniors, and 7 seniors. What part of the students present at the meeting were sophomores?
- (A) $\frac{1}{4}$
(B) $\frac{5}{8}$
(C) $\frac{7}{40}$
(D) $\frac{1}{5}$
(E) $\frac{1}{3}$
8. The Dobkin family budgets its monthly income as follows: $\frac{1}{3}$ for food, $\frac{1}{4}$ for rent, $\frac{1}{10}$ for clothing, and $\frac{1}{5}$ for savings. What part is left for other expenses?
- (A) $\frac{3}{7}$
(B) $\frac{1}{6}$
(C) $\frac{7}{60}$
(D) $\frac{2}{15}$
(E) $\frac{3}{20}$

2. FINDING FRACTIONS OF FRACTIONS

Many problems require you to find a fractional part of a fractional part, such as $\frac{3}{5}$ of $\frac{2}{3}$. This involves multiplying the fractions together, $\frac{3}{4}$ of $\frac{2}{3}$ is $\frac{1}{2}$.

Example:

$\frac{1}{4}$ of the employees of Mr. Brown's firm earn over \$20,000 per year. $\frac{1}{2}$ of the remainder earn between \$15,000 and \$20,000. What part of the employees earns less than \$15,000 per year?

Solution:

$\frac{1}{4}$ earn over \$20,000. $\frac{1}{2}$ of $\frac{3}{4}$ or $\frac{3}{8}$ earn between \$15,000 and \$20,000. That accounts for $\frac{1}{4} + \frac{3}{8}$ or $\frac{5}{8}$ of all employees. Therefore, the other $\frac{3}{8}$ earn less than \$15,000.

Example:

A full bottle of isopropyl alcohol is left open in the school laboratory. If $\frac{1}{3}$ of the isopropyl alcohol evaporates in the first 12 hours and $\frac{2}{3}$ of the remainder evaporates in the second 12 hours, what part of the bottle is full at the end of 24 hours?

Solution:

$\frac{1}{3}$ evaporates during the first 12 hours. $\frac{2}{3}$ of $\frac{2}{3}$ or $\frac{4}{9}$ evaporates during the second 12 hours. This accounts for $\frac{7}{9}$ of the isopropyl alcohol. Therefore, $\frac{2}{9}$ of the bottle is still full.

Exercise 2

Work out each problem. Circle the letter that appears before your answer.

- Mrs. Natt spent $\frac{2}{3}$ of the family income one year and divided the remainder between 4 different savings banks. If she put \$2000 into each bank, what was the amount of her family income that year?
 (A) \$8000
 (B) \$16,000
 (C) \$24,000
 (D) \$32,000
 (E) \$6000
- After selling $\frac{2}{5}$ of the suits in his shop before Christmas, Mr. Gross sold the remainder of the suits at the same price per suit after Christmas for \$4500. What was the income from the entire stock?
 (A) \$3000
 (B) \$7500
 (C) \$1800
 (D) \$2700
 (E) \$8000

3. Of this year's graduating seniors at South High, $\frac{9}{10}$ will be going to college. Of these, $\frac{4}{5}$ will go to four-year colleges, while the rest will be going to two-year colleges. What part of the class will be going to two-year colleges?
- (A) $\frac{9}{50}$
(B) $\frac{1}{5}$
(C) $\frac{4}{5}$
(D) $\frac{18}{25}$
(E) $\frac{4}{25}$
4. Sue and Judy drove from New York to San Francisco, a distance of 3000 miles. They covered $\frac{1}{10}$ of the distance the first day and $\frac{2}{9}$ of the remaining distance the second day. How many miles were left to be driven?
- (A) 600
(B) 2000
(C) 2400
(D) 2100
(E) 2700
5. 800 employees work for the Metropolitan Transportation Company. $\frac{1}{4}$ of these are college graduates, while $\frac{5}{6}$ of the remainder are high school graduates. What part of the employees never graduated from high school?
- (A) $\frac{1}{6}$
(B) $\frac{1}{8}$
(C) $\frac{7}{8}$
(D) $\frac{1}{12}$
(E) $\frac{3}{4}$

3. FINDING WHOLE NUMBERS

When a fractional part of a number is given and we wish to find the number representing the whole, it is often easiest to translate the words into mathematical symbols and solve the resulting equation.

Example:

Norman buys a used car for \$2400, which is $\frac{2}{5}$ of the original price. Find the original price.

Solution:

$$\begin{aligned}2400 &= \frac{2}{5}x && \text{Multiply by 5.} \\12000 &= 2x \\\$6000 &= x\end{aligned}$$

Example:

The gas gauge on Mary's car reads $\frac{1}{8}$ full. She asks the gasoline attendant to fill the tank and finds she needs 21 gallons. What is the capacity of her gas tank?

Solution:

$$\begin{aligned}\frac{7}{8} \text{ of the tank is empty and requires 21 gallons to fill.} \\ \frac{7}{8}x &= 21 && \text{Multiply by 8.} \\ 7x &= 168 \\ x &= 24\end{aligned}$$

Exercise 3

Work out each problem. Circle the letter that appears before your answer.

- Daniel spent \$4.50 for a ticket to the movies. This represents $\frac{3}{4}$ of his allowance for the week. What did he have left that week for other expenses?
(A) \$6.00
(B) \$4.00
(C) \$3.39
(D) \$1.13
(E) \$1.50
- 350 seniors attended the prom. This represents $\frac{7}{9}$ of the class. How many seniors did not attend the prom?
(A) 50
(B) 100
(C) 110
(D) 120
(E) 450
- A resolution was passed by a ratio of 5:4. If 900 people voted for the resolution, how many voted against it?
(A) 500
(B) 400
(C) 720
(D) 600
(E) 223
- Mr. Rich owns $\frac{2}{7}$ of a piece of property. If the value of his share is \$14,000, what is the total value of the property?
(A) \$70,000
(B) \$49,000
(C) \$98,000
(D) \$10,000
(E) \$35,000
- The Stone family spends \$500 per month for rent. This is $\frac{4}{15}$ of their total monthly income. Assuming that salaries remain constant, what is the Stone family income for one year?
(A) \$1875
(B) \$6000
(C) \$60,000
(D) \$22,500
(E) \$16,000

4. SOLVING WITH LETTERS

When problems use letters in place of numbers, the same principles discussed earlier apply. If you are not sure which operations to use, replace the letters with numbers to determine the steps needed in the solution.

Example:

It takes Mr. Cohen X days to paint his house. If he works for D days, what part of his house must still be painted?

Solution:

He has $X - D$ days of painting left to do out of a total of X days; therefore, $\frac{X - D}{X}$ is the correct answer.

Example:

Sue buys 500 stamps. X of these are 10-cent stamps. $\frac{1}{3}$ of the remainder are 15-cent stamps. How many 15-cent stamps does she buy?

Solution:

She buys $500 - X$ stamps that are not 10-cent stamps. $\frac{1}{3}$ of these are 15-cent stamps. Therefore, she buys $\frac{1}{3}(500 - X)$ or $\frac{500 - X}{3}$ 15-cent stamps.

Example:

John spent $\$X$ on the latest hit record album. This represents $\frac{1}{M}$ of his weekly allowance. What is his weekly allowance?

Solution:

Translate the sentence into an algebraic equation.

Let A = weekly allowance

$$X = \frac{1}{M} \cdot A \quad \text{Multiply by } M.$$

$$MX = A$$

Exercise 4

Work out each problem. Circle the letter that appears before your answer.

1. A class contains B boys and G girls. What part of the class is boys?
 - (A) $\frac{B}{G}$
 - (B) $\frac{G}{B}$
 - (C) $\frac{B}{B+G}$
 - (D) $\frac{B+G}{B}$
 - (E) $\frac{B}{B-G}$
2. M men agreed to rent a ski lodge for a total of D dollars. By the time they signed the contract, the price had increased by \$100. Find the amount each man had to contribute as his total share.
 - (A) $\frac{D}{M}$
 - (B) $\frac{D}{M} + 100$
 - (C) $\frac{D+100}{M}$
 - (D) $\frac{M}{D} + 100$
 - (E) $\frac{M+100}{D}$
3. Of S students in Bryant High, $\frac{1}{3}$ study French. $\frac{1}{4}$ of the remainder study Italian. How many of the students study Italian?
 - (A) $\frac{1}{6}S$
 - (B) $\frac{1}{4}S$
 - (C) $\frac{2}{3}S$
 - (D) $\frac{1}{12}S$
 - (E) $\frac{3}{7}S$
4. Mr. and Mrs. Feldman took t dollars in travelers checks with them on a trip. During the first week, they spent $\frac{1}{5}$ of their money. During the second week, they spent $\frac{1}{3}$ of the remainder. How much did they have left at the end of the second week?
 - (A) $\frac{4t}{15}$
 - (B) $\frac{t}{15}$
 - (C) $\frac{7t}{15}$
 - (D) $\frac{11t}{15}$
 - (E) $\frac{8t}{15}$
5. Frank's gas tank was $\frac{1}{4}$ full. After putting in G gallons of gasoline, the tank was $\frac{7}{8}$ full. What was the capacity of the tank?
 - (A) $\frac{5G}{8}$
 - (B) $\frac{8G}{5}$
 - (C) $\frac{8G}{7}$
 - (D) $\frac{7G}{8}$
 - (E) $4G$

RETEST

Work out each problem. Circle the letter that appears before your answer.

- The All Star Appliance Shop sold 10 refrigerators, 8 ranges, 12 freezers, 12 washing machines, and 8 clothes dryers during January. Freezers made up what part of the appliances sold in January?
 - $\frac{12}{50}$
 - $\frac{12}{25}$
 - $\frac{1}{2}$
 - $\frac{12}{40}$
 - $\frac{12}{60}$
- What part of a day is 4 hours 20 minutes?
 - $\frac{1}{6}$
 - $\frac{13}{300}$
 - $\frac{1}{3}$
 - $\frac{13}{72}$
 - $\frac{15}{77}$
- Mrs. Brown owns X books. $\frac{1}{3}$ of these are novels, $\frac{2}{5}$ of the remainder are poetry, and the rest are nonfiction. How many nonfiction books does Mrs. Brown own?
 - $\frac{4}{15}X$
 - $\frac{2}{5}X$
 - $\frac{2}{3}X$
 - $\frac{3}{5}X$
 - $\frac{7}{15}X$
- After typing $\frac{1}{4}$ of a term paper on Friday, Richard completed $\frac{2}{3}$ of the remainder on Saturday. If he wanted to finish the paper that weekend, what part was left to be typed on Sunday?
 - $\frac{1}{4}$
 - $\frac{2}{3}$
 - $\frac{1}{3}$
 - $\frac{1}{2}$
 - $\frac{5}{6}$
- What part of an hour elapses between 6:51 P.M. and 7:27 P.M.?
 - $\frac{1}{2}$
 - $\frac{2}{3}$
 - $\frac{3}{5}$
 - $\frac{17}{30}$
 - $\frac{7}{12}$
- Laurie spent 8 hours reading a novel. If she finished $\frac{2}{5}$ of the book, how many more hours will she need to read the rest of the book?
 - 20
 - 12
 - $3\frac{1}{5}$
 - 18
 - 10

7. Mrs. Bach spent $\frac{2}{7}$ of her weekly grocery money on produce. If she spent \$28 on produce, what was her total grocery bill that week?
- (A) \$70
(B) \$80
(C) \$56
(D) \$90
(E) \$98
8. After working on a new roof for X hours on Saturday, Mr. Goldman finished the job by working Y hours on Sunday. What part of the total job was done on Sunday?
- (A) $\frac{Y}{X+Y}$
(B) $\frac{Y}{X}$
(C) $\frac{X}{X+Y}$
(D) $\frac{Y}{X-Y}$
(E) $\frac{Y}{Y-X}$
9. $\frac{1}{2}$ of the women in the Spring Garden Club are over 60 years old. $\frac{1}{4}$ of the remainder are under 40. What part of the membership is between 40 and 60 years old?
- (A) $\frac{1}{4}$
(B) $\frac{3}{8}$
(C) $\frac{3}{4}$
(D) $\frac{1}{8}$
(E) $\frac{5}{8}$
10. A residential city block contains R one-family homes, S two-family homes, and T apartment houses. What part of the buildings on this block is made up of one or two family houses?
- (A) $\frac{R}{T} + \frac{S}{T}$
(B) $\frac{RS}{R+S+T}$
(C) $\frac{R+S}{R+S+T}$
(D) $\frac{R+S}{RST}$
(E) $R+S$

SOLUTIONS TO PRACTICE EXERCISES

Diagnostic Test

- (A) There was a total of 6 hours of programming time. $\frac{2}{6} = \frac{1}{3}$
- (D) Change all measurements to pints. One gallon is 8 pints. 2 qt. 1 pt. = 5 pints = $\frac{5}{8}$ gallon.
- (B) $\frac{1}{2} + \frac{1}{5} + \frac{1}{4} = \frac{10}{20} + \frac{4}{20} + \frac{5}{20} = \frac{19}{20}$. Therefore, $\frac{1}{20}$ was left to relax.
- (E) $\frac{3}{4}$ of $\frac{2}{3}$ or $\frac{1}{2}$ of the laundry was done before lunch. Since $\frac{1}{3}$ was done before breakfast, $\frac{1}{3} + \frac{1}{2}$ or $\frac{5}{6}$ was done before the afternoon, leaving $\frac{1}{6}$ for the afternoon.
- (A) $\frac{2}{3}$ of $\frac{3}{5}$ or $\frac{2}{5}$ of Glenn's allowance was spent on a gift. Since $\frac{2}{5}$ was spent on a hit record, $\frac{2}{5} + \frac{2}{5}$ or $\frac{4}{5}$ was spent, leaving $\frac{1}{5}$.
- (C) The tank contained $\frac{1}{4} \cdot 20$ or 5 gallons, leaving 15 gallons to fill the tank.
- (C) $42 = \frac{2}{9}x$ Multiply by 9. Divide by 2.
 $378 = 2x$
 $189 = x$
 This is the number of seniors. Since 42 seniors voted for the Copacabana, 147 did not.
- (A) After working for X hours, $M - X$ hours are left out of a total of M hours.
- (A) $\frac{1}{3}D$ dogs are large. $\frac{1}{4}$ of $\frac{2}{3}D$ or $\frac{1}{6}D$ are medium. The total of these dogs is $\frac{1}{3}D + \frac{1}{6}D$, leaving $\frac{1}{2}D$ small dogs.
- (B) There are $A + B$ books. B out of $A + B$ are biographies.

Exercise 1

- (C) There are 30 pupils in the class, of which 12 are girls. Therefore, $\frac{12}{30}$ or $\frac{2}{5}$ of the class is made up of girls.
- (D) The team won 34 games out of 40 or $\frac{34}{40}$ of its games. This simplifies to $\frac{17}{20}$.
- (B) 24 minutes is $\frac{24}{60}$ or $\frac{2}{5}$ of an hour.
- (D) The number of staff members is still 30. Of these, 9 are now women. Therefore $\frac{9}{30}$ or $\frac{3}{10}$ of the staff are women.
- (E) Let x = the number of juniors at the dance. $3x$ = the number of seniors at the dance. Then $4x$ = the number of students at the dance. x out of these $4x$ are juniors.
 That is $\frac{x}{4x}$ or $\frac{1}{4}$ of the students present are juniors.
- (A) Change all measurements to inches. One yard is 36 inches. 1 ft. 3 in. is 15 inches.
 $\frac{15}{36} = \frac{5}{12}$
- (D) There were 40 students at the meeting.
 $\frac{8}{40} = \frac{1}{5}$
- (C) $\frac{1}{3} + \frac{1}{4} + \frac{1}{10} + \frac{1}{5} = \frac{20}{60} + \frac{15}{60} + \frac{6}{60} + \frac{12}{60} = \frac{53}{60}$
 Therefore, $\frac{7}{60}$ is left for other expenses.

Exercise 2

1. (C) She put \$8000 into savings banks.

$$800 = \frac{1}{3}x \quad \text{Multiply by 3.}$$

$$\$24,000 = x$$

2. (B) $4500 = \frac{3}{5}x$ Multiply by $\frac{5}{3}$.

$$\$7500 = x$$

3. (A) Since $\frac{4}{5}$ of $\frac{9}{10}$ will go to four-year colleges, $\frac{1}{5}$ of $\frac{9}{10}$ or $\frac{9}{50}$ will go to two-year colleges.

4. (D) They covered $\frac{1}{10} \cdot 3000$ or 300 miles the first day, leaving 2700 miles still to drive. They covered $\frac{2}{9} \cdot 2700$ or 600 miles the second day, leaving 2100 miles still to drive.

5. (B) $\frac{5}{6}$ of $\frac{3}{4}$ or $\frac{5}{8}$ are high school graduates. Since $\frac{1}{4}$ are college graduates, $\frac{1}{4} + \frac{5}{8}$ or $\frac{7}{8}$ of the employees graduated from high school, leaving $\frac{1}{8}$ who did not.

Exercise 3

1. (E) $4.50 = \frac{3}{4}x$ Multiply by 4. Divide by 3.
 $18.00 = 3x$

$x = \$6.00$, his allowance for the week. $\$6.00 - \$4.50 = \$1.50$ left for other expenses.

2. (B) $350 = \frac{7}{9}x$ Multiply by 9. Divide by 7.
 $3150 = 7x$
 $450 = x$

This is the number of students in the class. If 350 attend the prom, 100 do not.

3. (C) $\frac{5}{9}$ of the voters voted for the resolution.
 $900 = \frac{5}{9}x$ Multiply by 9. Divide by 5.

$$8100 = 5x$$

$$1620 = x$$

$1620 - 900 = 720$ voted against the resolution.

4. (B) $\frac{2}{7}x = 14,000$ Multiply by 7. Divide by 2.
 $2x = 98,000$
 $x = \$49,000$

5. (D) $\frac{4}{15}x = 500$ Multiply by 15. Divide by 4. This is their *monthly* income.
 $4x = 7500$
 $x = \$1875$

Multiply by 12 to find yearly income: \$22,500.

Exercise 4

- (C) There are $B + G$ students in the class. B out of $B + G$ are boys.
- (C) The total cost is $D + 100$, which must be divided by the number of men to find each share. Since there are M men, each man must contribute $\frac{D+100}{M}$ dollars.
- (A) $\frac{1}{3}S$ students study French. $\frac{1}{4}$ of $\frac{2}{3}S$ or $\frac{1}{6}S$ study Italian.
- (E) They spent $\frac{1}{5}t$ the first week. They spent $\frac{1}{3}$ of $\frac{4}{5}t$ or $\frac{4}{15}t$ the second week. During these two weeks they spent a total of $\frac{1}{5}t + \frac{4}{15}t$ or $\frac{7}{15}t$, leaving $\frac{8}{15}t$.
- (B) The G gallons fill $\frac{7}{8} - \frac{1}{4}$ or $\frac{5}{8}$ of the tank.
 $\frac{5}{8}x = G$ Multiply by $\frac{8}{5}$.
 $x = \frac{8G}{5}$

Retest

- (A) There were 50 appliances sold in January; $\frac{12}{50}$ were freezers.
- (D) Change all measurements to minutes. One day is $60 \cdot 24$ or 1440 minutes. 4 hr. 20 min. = 260 min. $\frac{260}{1440} = \frac{13}{72}$
- (B) $\frac{1}{3}X$ books are novels. $\frac{2}{5}$ of $\frac{2}{3}X$ or $\frac{4}{15}X$ are poetry. The total of these books is $\frac{1}{3}X + \frac{4}{15}X$ or $\frac{9}{15}X$, leaving $\frac{6}{15}X$ or $\frac{2}{5}X$ books which are nonfiction.
- (A) $\frac{2}{3}$ of $\frac{3}{4}$ or $\frac{1}{2}$ of the term paper was completed on Saturday. Since $\frac{1}{4}$ was completed on Friday, $\frac{1}{4} + \frac{1}{2}$ or $\frac{3}{4}$ was completed before Sunday, leaving $\frac{1}{4}$ to be typed on Sunday.
- (C) 36 minutes is $\frac{36}{60}$ or $\frac{3}{5}$ of an hour.
- (B) $8 = \frac{2}{5}x$ Multiply by 5. Divide by 2.
 $40 = 2x$
 $20 = x$

This is the total number of hours needed to read the book. Since Laurie already read for 8 hours, she will need 12 more hours to finish the book.
- (E) $\frac{2}{7}x = 28$ Multiply by 7. Divide by 2.
 $2x = 196$
 $x = \$98$
- (A) Mr. Goldman worked a total of $X + Y$ hours. Y out of $X + Y$ was done on Sunday.
- (B) $\frac{1}{4}$ of $\frac{1}{2}$ or $\frac{1}{8}$ are under 40. Since $\frac{1}{2} + \frac{1}{8}$ or $\frac{5}{8}$ are over 60 or under 40, $\frac{3}{8}$ are between 40 and 60.
- (C) There is a total of $R + S + T$ buildings on the block. $R + S$ out of $R + S + T$ are one or two family houses.