Sketching of Some Common Curves.

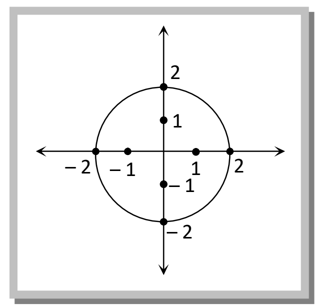
(1) **Straight line:** The general equation of a straight line is $ax + by + c = 0$. To draw a straight line, find the points where it meets with the coordinate axes by putting $y = 0$ and $x = 0$ respectively in its equation. By joining these two points, we get the sketch of the line.

(2) **Region represented by a linear inequality:** To find the region represented by linear inequalities $ax + by \leq c$ and $ax + by \geq c$, we proceed as follows.

(i) Convert the inequality into equality to obtain a linear equation in *x, y.*

(ii) Draw the straight line represented by it.

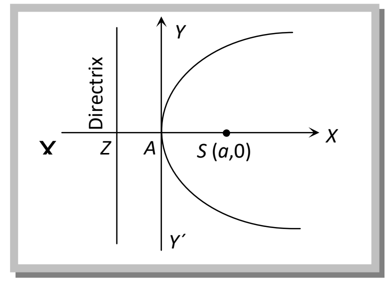
(iii)The straight line obtained in (ii) divides the *xy*-plane in two parts. To determine the region represented by the inequality choose some convenient points, *e.g.* origin or some point on the coordinate axes. If the coordinates of a point satisfy the inequality, then region containing the point is the required region, otherwise the region not containing the point is the required region.



(3) **Circle:** The equation of a circle having center at (0,0) and radius r is given by $x^2 + y^2 = r^2$. The equation of a circle having center at *(h, k)* and radius r is given by $(x-h)^2 + (y-k)^2 = r^2$. The general equation of a circle is $x^2 + y^2 + 2gx + 2fy + c = 0$. This represents the circle whose center is at (-*g*,-*f*) and radius equal to $\sqrt{g^2 + f^2 - c}$.

The figure of the circle $x^2 + y^2 = (2)^2$ is given. Here center is (0,0) and radius is 2.

(4) **Parabola:** There are four standard forms of parabola with vertex at origin and the axis along either of coordinate axis.

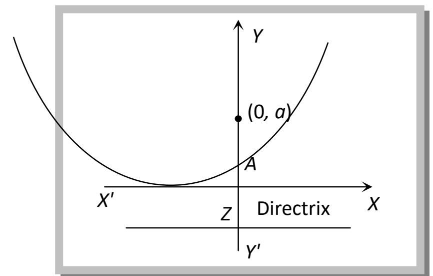


(i) $y^2 = \pm 4ax$: For this parabola

(a) Vertex: (0,0) (b) Focus: $(\pm a, 0)$

(c) Directrix: $x \pm a = 0$ (d) Latus rectum: $4a$

(e) Axis $y = 0$ (f) Symmetry: It is symmetric about x-axis.

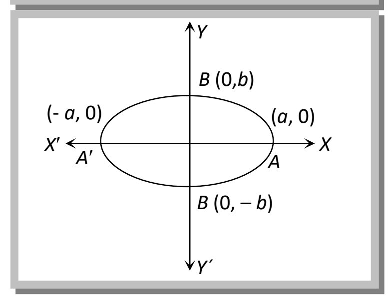


(ii) $x^2 = \pm 4ay$:For this parabola

(a) Vertex: (0,0) (b) Focus: $(0, \pm a)$

(c) Directrix: $y \pm a = 0$ (d) Latus rectum: $4a$

(e) Axis $x = 0$ (f) Symmetry: It is symmetric about y-axis



(5) **Ellipse:** The standard equation of the ellipse having its center at the origin and major and minor axes along the coordinate axes is $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$ Here $a > b$. The figure of the ellipse is given.