Chapter 11
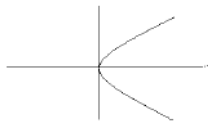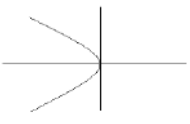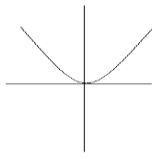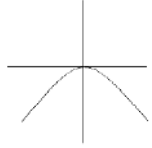
CONIC SECTION

CIRCLE:

The equation of a circle with centre at (h, k) and radius r is $(x - h)^2 + (y - k)^2 = r^2$

Equation of a circle with centre at origin and radius r is $x^2 + y^2 = r^2$

PARABOLA(Symmetric about its axis)

	Right	Left	Upward	Downward
Equation	$y^2 = 4ax$	$y^2 = -4ax$	$x^2 = 4ay$	$x^2 = -4ay$
Axis	y = 0	y= 0	x= 0	x= 0
Figure				
Focus	(a, 0)	(-a, 0)	(0, a)	(0, -a)
Vertex	(0,0)	(0,0)	(0,0)	(0,0)
Latus Rectum	4a	4a	4a	4a
Directrix	x = -a	x = a	y = -a	y =a

ELLIPSE (Symmetric about both the axis)

Equation	$\dfrac{x^2}{a^2} + \dfrac{y^2}{b^2} = 1$	$\dfrac{x^2}{b^2} + \dfrac{y^2}{a^2} = 1$
Equation of the major axis	y=0	x=0
Length of major axis	2a	2a
Length of minor axis	2b	2b
Vertices	($\pm$ a, 0)	(0,$\pm$ a)
Foci	($\pm$ c, 0)	(0,$\pm$ c)
Eccentricity	$e = \dfrac{c}{a}$	$e = \dfrac{c}{a}$
Latus Rectum	$\dfrac{2b^2}{a}$	$\dfrac{2b^2}{a}$

HYPERBOLA

Equation	$\dfrac{x^2}{a^2} - \dfrac{y^2}{b^2} = 1$	$\dfrac{y^2}{a^2} - \dfrac{x^2}{b^2} = 1$
Equation of the transverse axis	y =0	x =0
Length of transverse axis	2a	2a
Length of conugate axis	2b	2b
Vertices	$(\pm a, 0)$	$(0, \pm a)$
Foci	$(\pm c, 0)$	$(0, \pm c)$
Eccentricity	$e = \dfrac{c}{a}$	$e = \dfrac{c}{a}$
Latus Rectum	$\dfrac{2b^2}{a}$	$\dfrac{2b^2}{a}$

TEXT BOOK QUESTIONS

* →Exercise   11.1   →   Qns 10,11

* → Exercise   11.2   →   Qns 5,6,8

* → Exercise   11.3   →   Qns 5,6,7,8,9,10

* →Exercise   11.4   →   Qns 4,5,6

 * →Example   → 4,17,18,19

** →Exercise   11.1   →   Qns 9,12,13,14

 ** → Exercise   11.2   →   Qns 11,12

** → Exercise   11.3   →   Qns 13 to Qns 20

** → Exercise   11.4   →   Qns 10 to Qns 15

Extra Questions:

1.Find the centre and the radius of $3x^2 + 3y^2 + 6x - 4y - 1 = 0$

(ans : (-1, 2/3), 4/3)

2. Find the value of p so that $x^2 + y^2 + 8x + 10y + p = 0$, is the equation of the circle of radius 7 units.   (ans : -8)

3. Find the equation of the circle when the end points of the diameter are

   A (-2 ,3), B (3, -5)   (ans: $x^2 + y^2 - x + 2y - 21 = 0$)

4. Find the equation of the circle circumscribing the triangle formed by the straight lines: $x + y = 6$, $2x + y = 4$ and $x + 2y = 5$

(ans: $x^2 + y^2 - 17x - 19y + 50 = 0$)

5. Find the area of the triangle formed by the lines joining the vertex of the parabola $x^2 = 12y$ to the ends of its latus rectum. (ans : ½ x 12 x 3 sq.units)

6. Find the equation of the ellipse with eccentricity ¾ , foci on y- axis , center at the origin and passes through the point (6, 4)   (ans: $16x^2 + 7y^2 = 688$)

7. Find the length of major axis and minor axis of $4x^2 + y^2 = 100$

8. Find the equation of the parabola with the centre at origin, length of transverse axis 6 units and a focus at(0, 4).   (ans: $7y^2 - 9x^2 = 63$)

9. The line $5x - y = 3$ is a tangent to a circle at a point (2, 7) and its centre is on the line $x + 2y = 19$. Find the equation of the circle   (ans: $x^2 + y^2 - 14x - 12y + 59 = 0$)

10. Find equation of the circle which touches the y – axis at origin and whose radius is 3 units.   (ans: $x^2 + y^2 - 6x = 0$)