Chapter 11

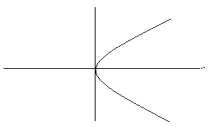
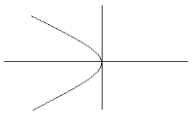
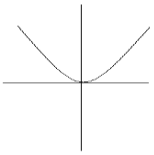
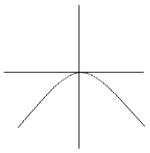
CONIC SECTION

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

HYPERBOLA

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

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

<u>Extra Questions:</u>

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: $x^2 + y^2 - 6x =0$)