

STD: XI

SUB: BUSINESS MATHEMATICS

UNIT: III ANALYTICAL GEOMETRY

2 marks (22)

Eg: 3.1, 3.2, 3.3, 3.4
 Ex: 3.2 - 1) 3)
 Eg: 3.10, 3.17, 3.18, 3.19
 Ex: 3.3 - 1)
 Eg: 3.23, 3.26, 3.28
 Ex: 2.4 - 1) 9)
 Eg: 3.29
 Ex: 3.5 - 1) 3)
 Eg: 3.33, 3.35
 Ex: 3.6 - 2)

3 marks (23)

Ex: 3.1 - 5) 3)
 Eg: 3.6, 3.8, 3.12, 3.15
 Ex: 3.2 - 4) Eg: 3.16
 Ex: 3.3 - 4)
 Eg: 3.21, 3.22, 3.24
 Ex: 3.4 - 2) 3) 8)
 Eg: 3.30
 Ex: 3.5 - 4) 2)
 Eg: 3.31, 3.32
 Ex: 3.6 - 1) 5) 6)

5 marks (12)

Eg: 3.7, 3.9
 Ex: 3.2 - 5)
 Eg: 3.11, 3.13
 Ex: 3.3 3)
 Eg: 3.25
 Ex: 3.4 - 5) 6)
 Eg: 3.34
 Ex: 3.6 - 4) 3)

UNIT: IV TRIGONOMETRY

2 marks (18)

Eg: 4.4, 4.5
 Ex: 4.2 - 1) i) ii) iii) 3) ii)
 Ex: 4.3 - 1) 2)
 Eg: 4.25 - i) ii), 4.26
 Ex: 4.4 - 1) i) ii) (iii) (iv)
 2) i) ii)

3 marks (17)

Ex: 4.1 - 6)
 Eg: 4.8, 4.11, 4.13
 Ex: 4.2 - 3) i) ii) iii) 5)
 Eg: 4.15, 4.16, 4.19
 Eg: 4.21
 Ex: 4.3 3) i) ii)
 Eg: 4.28, 4.29, 4.30

5 marks (18)

Ex: 4.1 - 9) ii) 10) 7)
 Ex: 4.2 - 7) 11) 12) 13)
 15) 14)
 Eg: 4.20, 4.22
 Ex: 4.3 - 7) 9) 10)
 Eg: 4.27
 Ex: 4.4 - 8) 4) 9)

UNIT: V DIFFERENTIAL CALCULUS

2 marks (16)

Eg: 5.20, 5.21, 5.22
 Eg: 5.34, 5.43 i) ii)
 Ex: 5.6 - 3
 Ex: 5.8 - 1) i) ii) iii) iv)
 Eg: 5.46 - i) ii) iii)
 Eg: 5.47, 5.1

3 marks (21)

Eg: 5.25, 5.3, 5.7
 Ex: 5.2 - 1) ii) 2) 3) 4)
 Eg: 5.35
 Ex: 5.5 - 1) viii) 2) i) 3) v)
 4) i) vi)
 Eg: 5.36, 5.44
 Ex: 5.9 - 1) ii) iii)
 Ex: 5.1 - 2) 3) 5)

5 marks (20)

Ex: 5.2 - 5)
 Ex: 5.3 - 1) a) b)
 5.2, 13) - 1) 2)
 Ex: 5.4 i)
 Eg: 5.38, 5.39, 5.43
 Ex: 5.6 - 1) i) 2)
 Ex: 5.7 - 2)
 Ex: 5.8 - 2) 3)
 Ex: 5.9 - 2) 3) 4) 5) 6)

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SUB: BUSINESS MATHEMATICS

UNIT: III ANALYTICAL GEOMETRY

Formula:1) distance between two points $A(x_1, y_1)$ and $B(x_2, y_2)$

$$\text{distance } AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

2.) Given slope = m , y -intercept = c

$$\text{Equation of st. line } \boxed{y = mx + c}$$

3) Given point $P(x_1, y_1)$, slope = m

$$\text{Equation of st. line } \boxed{y - y_1 = m(x - x_1)}$$

4) Given two points $A(x_1, y_1)$ & $B(x_2, y_2)$

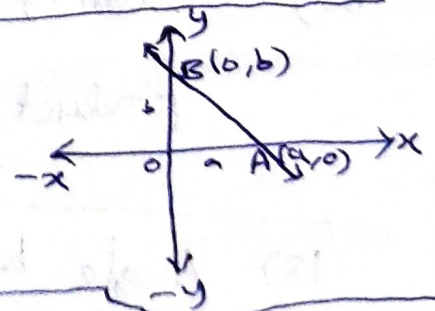
$$\text{Equation of st. line } \boxed{\frac{y - y_1}{y_2 - y_1} = \frac{x - x_1}{x_2 - x_1}}$$

5) Given two points $A(x_1, y_1)$ & $B(x_2, y_2)$ determinant form

$$\text{Equation of st. line } \begin{vmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{vmatrix} = 0$$

6.) Intercept form: $A(a, 0)$ & $B(0, b)$

$$\frac{x}{a} + \frac{y}{b} = 1$$

7.) Equation of st. line in General form

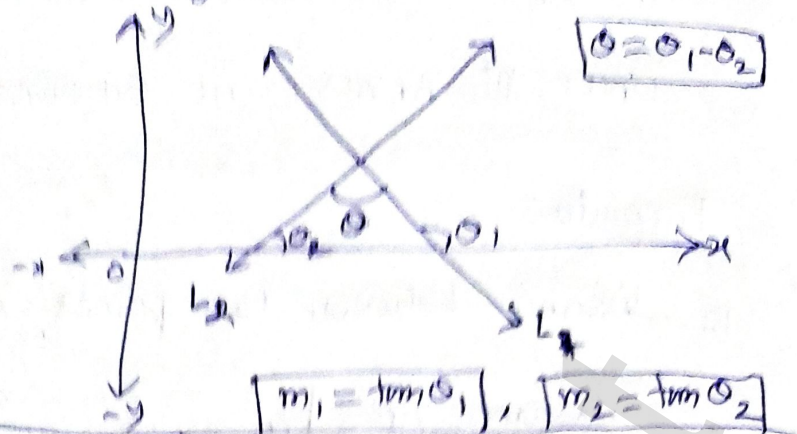
$$ax + by + c = 0, \text{ where } a, b \text{ \& } c \text{ are constants}$$

$a \& b$ are not simultaneously zero

8.) Angle between two straight lines

$$\tan \theta = \left| \frac{m_1 - m_2}{1 + m_1 m_2} \right|$$

$$\theta = \tan^{-1} \left| \frac{m_1 - m_2}{1 + m_1 m_2} \right|$$



9) concurrent

⊗

condition for three lines
are concurrent.

$$a_1 x + b_1 y + c_1 = 0$$

$$a_2 x + b_2 y + c_2 = 0$$

$$a_3 x + b_3 y + c_3 = 0$$

$$\begin{vmatrix} a_1 & b_1 & c_1 \\ a_2 & b_2 & c_2 \\ a_3 & b_3 & c_3 \end{vmatrix} = 0$$

10) pair of straight lines:

$$\text{General equation } ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$$

where a, b, c, f, g and h are all constants.

11.) pair of straight line passing through origin

$$\text{General equation } ax^2 + 2hxy + by^2 = 0$$

12.) sum of slope $m_1 + m_2 = -\frac{2h}{b}$

product of slope $m_1 m_2 = \frac{a}{b}$

13) Angle between pair of st. lines passing through the origin

$$\theta = \tan^{-1} \left[\left| \frac{2\sqrt{h^2 - ab}}{a+b} \right| \right]$$

14) The condition for a general second degree equation in x, y namely $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ to represent a pair of straight lines is

$$abc + 2fgh - af^2 - bg^2 - ch^2 = 0$$

15.) The condition in determinant form is $\begin{vmatrix} a & h & g \\ h & b & f \\ g & f & c \end{vmatrix} = 0$

16.) Circles: Given centre $c(h, k)$ & point $P(x, y)$

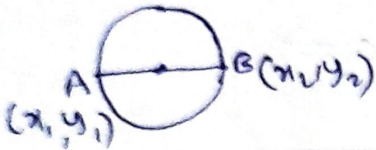


distance $CP = r$ radius

$$CP^2 = r^2$$

Equation of circle $\boxed{(x-h)^2 + (y-k)^2 = r^2}$

17.) Equation of circles when the end points of a diameter are given



Equation of circle

$$\boxed{(x-x_1)(x-x_2) + (y-y_1)(y-y_2) = 0}$$

18.) General equation of circle $\boxed{x^2 + y^2 + 2gx + 2fy + c = 0}$

centre $c(-g, -f)$, radius $r = \sqrt{g^2 + f^2 - c}$

19.) The general second degree equation

$ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ represents a

circle if (i) $a = b$, i.e., coeff. of $x^2 =$ coeff. of y^2

(ii) $h = 0$, no xy term

20.) Parametric form. of a circle: $x = r \cos \theta$, $y = r \sin \theta$

$$0 \leq \theta \leq 2\pi \quad \therefore \boxed{x^2 + y^2 = r^2}$$

21.) Tangents: Equation of the tangent (x_1, y_1) to the circle

$$x^2 + y^2 = a^2 \quad \text{is} \quad \boxed{xx_1 + yy_1 = a^2}$$

22.) Mid pt. $x = \frac{x_1 + x_2}{2}$, $y = \frac{y_1 + y_2}{2}$

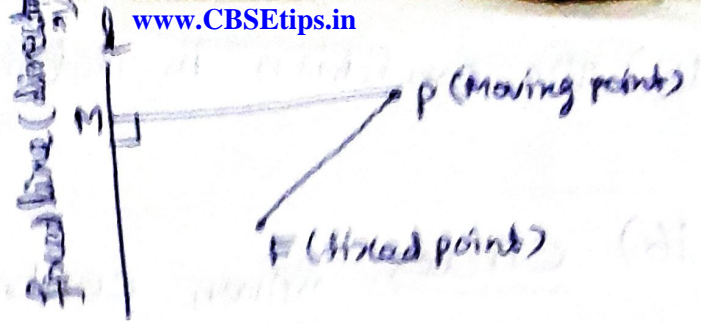
23.) Length of tangent to the circle $x^2 + y^2 + 2gx + 2fy + c = 0$

from a point $P(x_1, y_1)$ is $\boxed{PT = \sqrt{x_1^2 + y_1^2 + 2gx_1 + 2fy_1 + c}}$

24.) Condition for any line $y = mx + c$ to be a tangent to the circle $x^2 + y^2 = a^2$ is $\boxed{c^2 = a^2(1 + m^2)}$

25.) Conics

$$\frac{FP}{PM} = e$$



a) If $e = 1$

then, the conic is called a "parabola"

b) If $e < 1$

then, the conic is called an "ellipse"

c) If $e > 1$

then, the conic is called a "hyperbola"

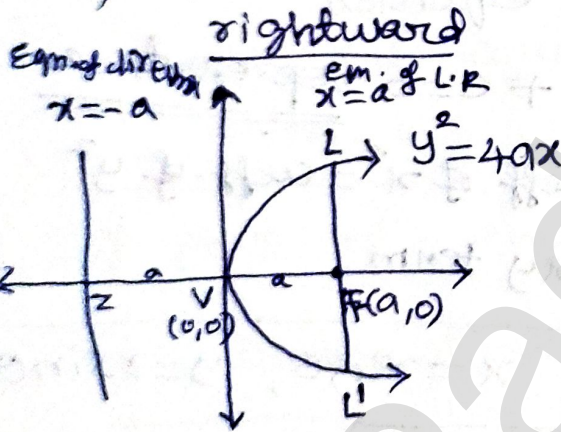
26.) $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$

(i) a parabola if $h^2 - ab = 0$

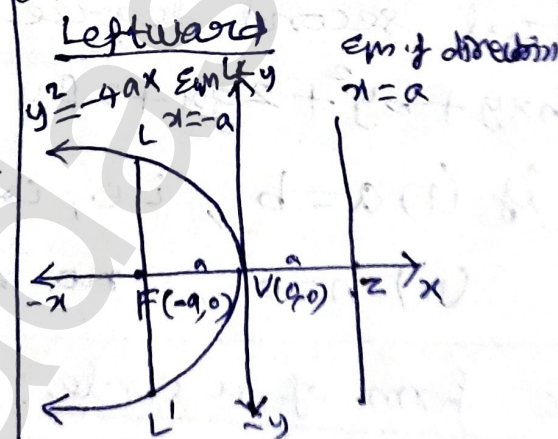
(ii) an ellipse if $h^2 - ab < 0$

(iii) a hyperbola if $h^2 - ab > 0$

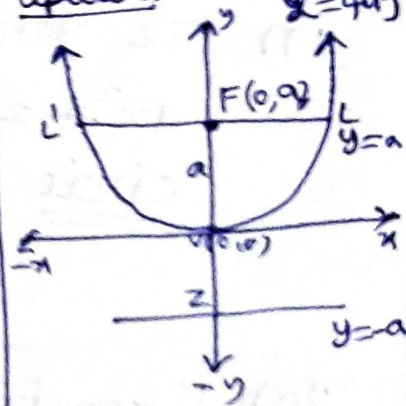
27.) (i) parabola open rightward



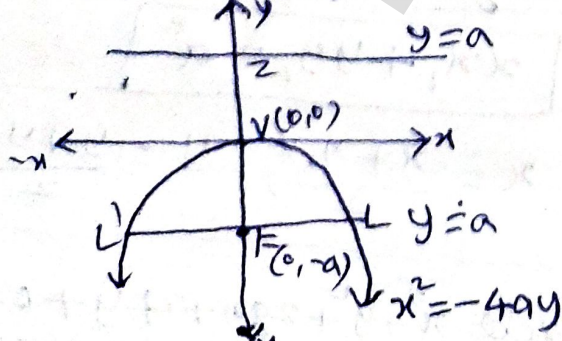
(ii) parabola open leftward



(iii) parabola open upward



(iv) parabola open downward



Vertex $V(h, k) = V(0, 0)$

| | Eqn of LR | Eqn of directrix |
|-----------------------|-----------|------------------|
| (i) Focus $F(a, 0)$ | $x = a$ | $x = -a$ |
| (ii) Focus $F(-a, 0)$ | $x = -a$ | $x = a$ |
| (iii) Focus $F(0, a)$ | $y = a$ | $y = -a$ |
| (iv) Focus $F(0, -a)$ | $y = -a$ | $y = a$ |