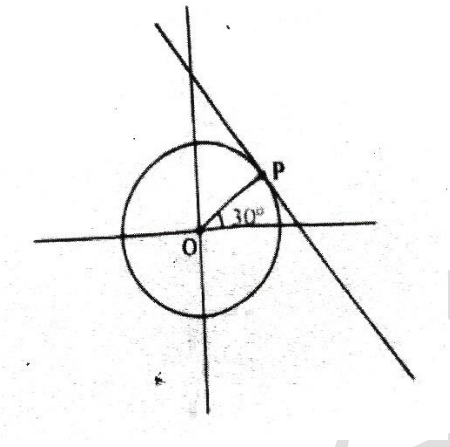
CHAPTER 10

STRAIGHT LINES

DECEMBER 2020

1. A point R with x coordinate 4 lies on the line segment joining the points P(2, −3, 4) and Q(8, 0, 10).
   a) Find the ratio in which R divides PQ. (2)
   b) Find the coordinates of R (1)

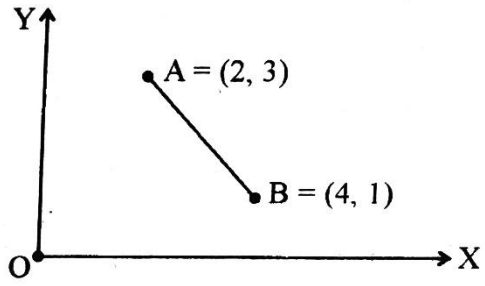
2. Consider the circle $x^2 + y^2 = 1$, given in figure. Let OP makes an angle 30^0 with the x axis.



   i) Find the equation of the tangent line to the circle passing through the point P. (2)
   ii) Find the x intercept and y intercept made by the line. (2)
   iii) Find the equation of the other tangent to the circle parallel to the first one. (2)

MARCH 2020

3. Consider the following diagram:
   a) Find equation of a line passing through the midpoint of AB and perpendicular to AB. (2)
   b) Find a point C on x axis which is equidistant from A and B. (2)
   c) Find area of ΔABC. (2)



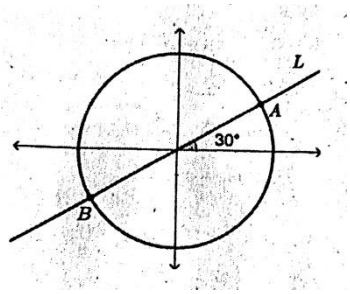
IMPROVEMENT 2019

4. a) The slope of the line through the point (2,5) and (−3,6) is ……. (1)
   b) Find the equation of the line passing through the point (−3,5) and perpendicular to the line through the points (2,5) and (−3,6). (2)
   c) If A, B, C are in arithmetic progression, then the straight line $Ax + By + C = 0$ always passes through the point
   i) (1, −2) ii) (2, −1)
   iii) (0, 0) iv) (1, 2) (1)

5. Consider the straight line $3x - 4y - 16 = 0$.
   a) Find the slope of the line. (1)
   b) Slope of a line which is perpendicular to the above line. (1)
   c) Find the equation of the line passing through (−1,3) to this line. (1)
   d) Find the coordinates of the foot of the perpendicular from the point (−1,3) to this line. (1)

MARCH 2019

6. The figure shows a unit circle and a line L which makes 30^0 with the positive direction of x axis.
   a) Write the equation of the line L. (2)
   b) Write the coordinates of the points A and B (2)
   c) Find the equation o fthe tangent line to the circle at A. (2)



7. Consider two lines:
   $L_1 : 2x + y = 4$
   $L_2 : 2x - y = 2$
   a) Find the angle between L_1 and L_2 (2)
   b) Find the equation of the line passing through the intersection of L_1 and L_2 which makes and angle 45^0 with the positive direction of x-axis. (3)
   c) Find the x and y intercepts of the third line obtained in the above question (b). (1)

IMPROVEMENT 2018

8. a) Find the equation of the perpendicular bisector of the line joining the points $(0,0)$ *and* $(-3,4)$. (3)
   b) Find the coordinates of the point on the line $y = 3x + 2$ that is equidistant from $(0,0)$ *and* $(-3,4)$ (1)

9. a) Reduce the equation $x - y = 4$ into normal form. (3)
   b) Write the distance of this line from origin.

MARCH 2018

No separate question in the Chapter asked. But they combined question from the chapters Linear inequalities and Straight lines.
Refer: **Chapter 6 Linear Inequalities**: Q 9

IMPROVEMENT 2017

10. a) Slope of the line $2x + 3y - 6 = 0$ is ……
    i) $\frac{-2}{3}$ ii) $\frac{-3}{2}$
    iii) 2 iv) 3 (1)
    b) Find the equation of the line perpendicular to $2x + 3y - 6 = 0$ and passing through (–1,1). (3)
    c) Find the foot of the perpendicular from (–1,1) to the line $2x + 3y - 6 = 0$. (2)

Or

    a) Slope of a line making an angle of 120^0 with positive direction of X – axis is …… (1)
    i) $\frac{-1}{2}$ ii) $\frac{\sqrt{3}}{2}$
    iii) $-\sqrt{3}$ iv) $-\frac{1}{\sqrt{3}}$

b) Find the x and y intercepts of the line $3x-4y+10=0$. (2)

c) Find the angle between the lines $y=\sqrt{3}x+5$ and $\sqrt{3}y+x+6=0$ (3)

MARCH 2017

11. a) The slope of the line passing through the points (3,–2) and (7,–2) is ……..

i) –1 ii) 2

iii) 0 iv)1 (1)

b) Reduce the equation $6x+3y-5=0$ into slope-intercept from and hence find its slope and y- intercept. (2)

c) Find a point on the x- axis which is equidistant from the points (7,6) and (3,4). (2)

IMPROVEMENT 2016

12. a) Which is the slope of the line perpendicular to the line with slope $\frac{-3}{2}$?

i) $\frac{-3}{2}$ ii) $\frac{-2}{3}$

iii) $\frac{3}{2}$ iv) $\frac{2}{3}$ (1)

b) Find the equation of the line intersecting the x-axis at a distance of 3 units to the left of origin with slop -2. (2)

c) Assume that straight lines work as the plane mirror for a point, find the image of the point (1,2) in the line $x-3y+4=0$. (3)

MARCH 2016

13. a) Which one of the following pair of straight lines are parallel?

i) $x-2y-4=0 \;;2x-3y-4=0$

ii) $x-2y-4=0 \;;x-2y-5=0$

iii) $2x-3y-8=0\;;3x-3y-8=0$

iv) $2x-3y-8=0;3x-2y-8=0$ (1)

b) Equation of a straight line is $3x-4y+10=0$. Convert it into the intercept form and write the x- intercept and y – intercept. (2)

c) Find the equation of the line perpendicular to the line $x-7y+5=0$ and having x-intercept 3. (3)

SEPTEMBER 2015

14. a) Slope of a line $'L_1'$ making an angle 135^0 with the positive direction of the x- axis is ……

i) 1 ii) –1

iii) $\sqrt{3}$ iv) $-\sqrt{3}$ (1)

b) Find the equation of the line $'L_2'$ perpendicular to $'L_1'$ and passing through the point (–2,3) (2)

c) Find the equation of line passing through the intersection of $4x-y+7=0$ and which is parallel to $5x+4y-20=0$ (3)

OR

a) Slope of the line $L:2x+3y+5=0$ is ……. (1)

i) $-\frac{2}{3}$ ii) $\frac{2}{3}$ iii) $-\frac{3}{2}$ iv) $\frac{3}{2}$

b) Find the equation of the line L^1 parallel to L and passing through (2,2). (2)

c) Find the distance of the lines L and L^1 from the origin. Also find the distance between the lines L and L'. (3)

MARCH 2015

15. a) Find the equation of the line passing through the points (3,–2) and (–1,4). (2)

b) Reduce the equation $\sqrt{3}x + y - 8 = 0$ into normal form. (2)

c) If the angle between two lines is $\pi / 4$ and slope of one of the lines is $\frac{1}{2}$, find the slope of the other line. (2)

IMPROVEMENT 2014

16. a) Find the equation of the line passing through the two points (1,–1) and (3,5). (2)

b) Find the angle between the lines $y - \sqrt{3}x - 5 = 0$ and $\sqrt{3}y - x + 6 = 0$ (4)

MARCH 2014

17. a) Find the slope of the line passing through the point(3,–2) and (–1,4). (1)

b) Find the distance of the point(3,–5) from the line 3x–4y–26=0. (2)

c) Consider the equation of the line 3x–4y+10=0. Find its:

i) slope. (1)

ii) x and y intercepts. (2)

IMPROVEMENT 2013

18. Consider the line joining the points P(–4,1) and Q (0,5).

a) Write the coordinates of the midpoint of PQ. (1)

b) Find the equation of the line passing through the midpoint of PQ and parallel to the line 3x–4y+2=0. (2)

19. Consider the x+3y–7=0

a) The slope of the line is …….. (1)

b) Find the image of the point (3,8) with respect to the given line. (2)

MARCH 2013

20. a) Find the slope of the line joining the points (2,2) and (5,3). (1)

b) Find the equation of the line joining the points (2,2) and (5,3). (2)

21. a) If two lines are perpendicular, then the product of their slopes is ……. (1)

b) Find the equation of a line perpendicular to the line x–2x+3=0 and passing through the point (1,–2). (2)

IMPROVEMENT 2012

22. The vertices of ΔABC are $A(2,1), B(-3,5)$ *and* $C(4,5)$.

i) Write the co-ordinates of the midpoint of AC. (1)

ii) Find the equation of the median through the vertex B. (2)

MARCH 2012

23. The vertices of ΔABC are A(−2,3) , B (2,−3) and C (4,5).
    a) Find the slope of BC. (1)
    b) Find the equation of the altitude of ΔABC passing through A. (2)

MARCH 2011

24. Consider the straight line 3x+4y+8=0.
    a) What is the slope of a line which is perpendicular to the given line? (1)
    b) If the perpendicular line passes through (2,3), form its equation. (2)
    c) Find the foot of the perpendicular drawn from (2,3) to the given line. (3)

IMPROVEMENT 2010

25. a) Find the slope of the line $\frac{x}{a}+\frac{x}{b}=1$. (1)
    b) If the lines joining the points (0,0), (1,1) and (2,2), (4,y) are perpendicular, find y. (2)
26. a) Write the equation of y-axis. (1)
    b) Find the distance between the lines 8x+15y−5=0 and 8x+15y+12=0 (2)

MARCH 2010

27. i) Find the slope of the line joining (−2,6) and (4,8). (1)
    ii) Find the value of x if the above line is perpendicular to the line joining (8,12) and (x,24). (2)
28. i) Reduce the equation 3x+4y−12=0 into intercept form. (1)
    ii) Find the distance of the above line from its origin. (1)
    iii) Find the distance of the above line from the line 6x+8y−18=0. (1)

IMPROVEMENT 2009

29. Consider the points A(2,2) and B(5,3).
    i) Find the slope of the line through the points A and B. (1)
    ii) Find the equation of the line passing through the points A and B. (1)
    iii) Find the image of the point (1,2) in the line through A and B. (3)

MARCH 2009

30. a) Find the angle between the x-axis and the line joining (2,−1)and (4,−3). (1)
    b) Convert the equation of the line $2x-3y+6=0$ into intercept form. (1)
31. a) Find the distance between the pair of lines $4x-3y-9=0$ and $8x-6y-21=0$. (1)
    b) Find the distance of the point (3,−3) from the line $3x-4y-26=0$. (2)

IMPROVEMENT 2008

32. Consider the points $A(6,2), B(3,-1)$ and $C(-2,4)$
    i) Find AB,BC and AC. (1)
    ii) Show that ΔABC is a right angled triangle. (1)
33. i) The point of concurrence of the medians of a triangle is called…… (1)
    ii) Show that the points (−1,−1) , (2,3) and (8,11) are collinear. (2)
34. Consider the straight line passing through A(−2,6) and B (4,8).

i) Find the slope of the straight line passing through A and B. (1)

ii) Prove that the straight line AB is perpendicular to y+3x=2. (2)