MATHEMATICS

DPP
DAILY PRACTICE PROBLEMS

DPP No. 51

Total Marks : 26

Max. Time : 26 min.

Topics : Circle, Straight Lines, Pair of Straight Lines

Type of Questions		M.M., Min.
Single choice Objective (no negative marking) Q.1,2,3,4,5,6	(3 marks, 3 min.)	[18, 18]
Match the Following (no negative marking) Q.7	(8 marks, 8 min.)	[8, 8]

1. If one end of a diameter of the circle $x^2 + y^2 - 4x - 6y + 11 = 0$ is $(3, 4)$ then the co-ordinates of the other end are :
(A) $(1, 2)$ (B) $(2, 1)$ (C) $(-1, 2)$ (D) none of these

2. A circle is concentric with circle $x^2 + y^2 - 2x + 4y - 20 = 0$. If perimeter of the semicircle is 36 then the equation of the circle is : [use $\pi = 22/7$]
(A) $x^2 + y^2 - 2x + 4y - 44 = 0$ (B) $(x - 1)^2 + (y + 2)^2 = (126/11)^2$
(C) $x^2 + y^2 - 2x + 4y - 43 = 0$ (D) $x^2 + y^2 - 2x + 4y - 49 = 0$

3. Given two circles $x^2 + y^2 - 6x - 2y + 5 = 0$ & $x^2 + y^2 + 6x + 22y + 5 = 0$. The tangent at $(2, -1)$ to the first circle :
(A) passes outside the second circle
(B) touches the second circle
(C) intersects the second circle in 2 real points
(D) passes through the centre of the second circle.

4. The radius of the circle inscribed in the triangle formed by the line $3x + 4y = 24$ & the co-ordinate axes is :
(A) 2 units   (B) 3/2 units   (C) 5/2 units   (D) none of these

5. The equation of the circle of radius 5 in the first quadrant which touches the x-axis and the line $3x - 4y = 0$ is :
(A) $x^2 + y^2 - 24x - y - 25 = 0$ (B) $x^2 + y^2 - 30x - 10y + 225 = 0$
(C) $x^2 + y^2 - 16x - 18y + 64 = 0$ (D) $x^2 + y^2 - 20x - 12y + 144 = 0$

6. Suppose a ray of light leaves the point $(3, 4)$ reflects from the y-axis and moves towards the x-axis, then reflects from the x-axis, and finally arrives at the point $(8, 2)$, then the value of x, is
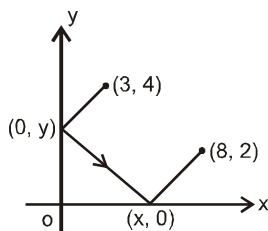
(A) $x = 4\dfrac{1}{2}$ (B) $x = 4\dfrac{1}{3}$ (C) $x = 4\dfrac{2}{3}$ (D) $5\dfrac{1}{3}$

7. Consider the general equation of second degree $ax^2 + by^2 + 2hxy + 2gx + 2fy + c = 0$. If this equation represents a pair of straight lines, map the two columns in the most accurate sense.
Match the column

Column – I		Column – II	
(A)	If (x_1, y_1) is the point of intersection of the two lines, then $(ax_1 + hy_1)(hx_1 + by_1) =$	(p)	$\dfrac{c}{\sqrt{(a-b)^2 + 4h^2}}$
(B)	$af^2 + bg^2 + ch^2 =$	(q)	ab
(C)	The lines are parallel if $h^2 =$	(r)	fg
(D)	Product of perpendiculars from the origin	(s)	$abc + 2fgh$

Answers Key

1. (A)

2. (A)

3. (B)

4. (A)

5. (B)

6. (B)

7. (A)→(r), (B)→(s), (C)→(q), (D)→ (p)