DCAM classes
Dynamic Classes for Academic Mastery

DPP - Daily Practice Problems

Chapter-wise Sheets

Date : | Start Time : | End Time :

MATHEMATICS CM10

SYLLABUS : Straight Lines and Pair of Straight Lines

Max. Marks : 120 **Marking Scheme :** (+4) for correct & (–1) for incorrect answer **Time : 60 min.**

INSTRUCTIONS : This Daily Practice Problem Sheet contains 30 MCQ's. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.

1. If $(-4, 5)$ is one vertex and $7x - y + 8 = 0$ is one diagonal of a square, then the equation of second diagonal is

(a) $x + 3y = 21$ (b) $2x - 3y = 7$

(c) $x + 7y = 31$ (d) $2x + 3y = 21$

2. Two lines are given by $(x - 2y)^2 + k(x - 2y) = 0$. The value of k, so that the distance between them is 3, is :

(a) $k = 0$ (b) $k = \pm 3\sqrt{5}$

(c) $k = \pm\sqrt{5}$ (d) $k = 3$

3. A line through A $(-5, -4)$ meets the line $x + 3y + 2 = 0$, $2x + y + 4 = 0$ and $x - y - 5 = 0$ at B, C and D respectively. If $\left(\frac{15}{AB}\right)^2 + \left(\frac{10}{AC}\right)^2 = \left(\frac{6}{AD}\right)^2$, then the equation of the line is

(a) $2x + 3y + 22 = 0$ (b) $5x - 4y + 7 = 0$

(c) $3x - 2y + 3 = 0$ (d) None of these

4. The number of lines that are parallel to $2x + 6y + 7 = 0$ and have an intercept of length 10 between the coordinate axes is

(a) 1 (b) 2

(c) 4 (d) Infinitely many

RESPONSE GRID	1. ⓐⓑⓒⓓ	2. ⓐⓑⓒⓓ	3. ⓐⓑⓒⓓ	4. ⓐⓑⓒⓓ

Space for Rough Work

5. The distance of the point (1, 2) from the line $x + y + 5 = 0$ measured along the line parallel to $3x - y = 7$ is equal to

(a) $4\sqrt{10}$ (b) 40

(c) $\sqrt{40}$ (d) $10\sqrt{2}$

6. If p_1, p_2 are the lengths of the normals drawn from the origin on the lines $x\cos\theta + y\sin\theta = 2a\cos 4\theta$ and $x\sec\theta + y\,\text{cosec}\,\theta = 4a\cos 2\theta$

respectively, and $mp_1^2 + np_2^2 = 4a^2$. Then

(a) $m = 1, n = 1$ (b) $m = 1, n = 4$

(c) $m = 4, n = 1$ (d) $m = 1, n = -1$

7. For what value of 'p' , $y^2 + xy + px^2 - x - 2y + p = 0$ represent 2 straight lines :

(a) 2 (b) $\frac{2}{3}$

(c) $\frac{1}{4}$ (d) $\frac{1}{2}$

8. One vertex of an equilateral triangle is $(2,3)$ and the equation of line opposite to the vertex is $x + y = 2$, then the equation of remaining two sides are

(a) $y - 3 = (2 \pm \sqrt{3})(x - 2)$ (b) $y + 3 = (2 \pm \sqrt{3})(x + 2)$

(c) $y + 3 = ((3 \pm \sqrt{2})(x + 2)$ (d) $y - 3 = (3 \pm \sqrt{2})(x - 2)$

9. The point on the line $x + y = 4$ which lie at a unit distance from the line $4x + 3y = 10$, are

(a) $(3, 1), (-7, 11)$ (b) $(3, 1), (7, 11)$

(c) $(-3, 1), (-7, 11)$ (d) $(1, 3), (-7, 11)$

10. The straight line $y = x - 2$ rotates about a point where it cuts the x-axis and becomes perpendicular to the straight line $ax + by + c = 0$. Then its equation is

(a) $ax + by + 2a = 0$ (b) $ax - by - 2a = 0$

(c) $bx + ay - 2b = 0$ (d) $ay - bx + 2b = 0$

11. The number of possible straight lines, passing through (2, 3) and forming a triangle with coordinate axes, whose area is 12 sq. units, is

(a) 1 (b) 2

(c) 3 (d) 4

12. The slopes of the lines represented by $x^2 + 2hxy + 2y^2 = 0$ are in the ratio 1 : 2, then h equals

(a) $\pm\frac{1}{2}$ (b) $\pm\frac{3}{2}$

(c) ± 1 (d) ± 3

13. The distance of the line $2x + y = 3$ from the point $(-1, 3)$ in the direction whose slope is 1 is

(a) $\frac{2}{3}$ (b) $\frac{\sqrt{2}}{3}$

(c) $\frac{2\sqrt{2}}{3}$ (d) $\frac{2\sqrt{5}}{3}$

14. The equation of the straight line, the portion of which intercepted between the coordinate axes being divided by the point $(-5, 4)$ in the ratio 1 : 2, is

(a) $8x + 5y = 60$ (b) $8x - 5y = 60$

(c) $-8x + 5y = 60$ (d) None of these

RESPONSE GRID					
	5. ⓐⓑⓒⓓ	**6.** ⓐⓑⓒⓓ	**7.** ⓐⓑⓒⓓ	**8.** ⓐⓑⓒⓓ	**9.** ⓐⓑⓒⓓ
	10. ⓐⓑⓒⓓ	**11.** ⓐⓑⓒⓓ	**12.** ⓐⓑⓒⓓ	**13.** ⓐⓑⓒⓓ	**14.** ⓐⓑⓒⓓ

Space for Rough Work

15. The reflection of the point (4, –13) in the line $5x+y+6=0$, is
(a) (–1, –14) (b) (3, 4)
(c) (1, 2) (d) (–4, 13)

16. The combined equation of the pair of lines through the point (1, 0) and parallel to the lines represented by $2x^2-xy-y^2=0$ is
(a) $2x^2-xy-y^2-4x-y=0$
(b) $2x^2-xy-y^2-4x+y+2=0$
(c) $2x^2+xy+y^2-2x+y=0$
(d) None of these

17. P is a point on either of the two lines $y-\sqrt{3}|x|=2$ at a distance of 5 units from their point of intersection. The coordinates of the foot of the perpendicular from P on the bisector of the angle between them are
(a) $\left(0, \frac{4+5\sqrt{3}}{2}\right)$ or $\left(0, \frac{4-5\sqrt{3}}{2}\right)$ depending on which the point P is taken
(b) $\left(0, \frac{4+5\sqrt{3}}{2}\right)$
(c) $\left(0, \frac{4-5\sqrt{3}}{2}\right)$
(d) $\left(\frac{5}{2}, \frac{5\sqrt{3}}{2}\right)$

18. The distance between the parallel lines $9x^2-6xy+y^2+18x-6y+8=0$ is
(a) $\frac{2}{\sqrt{10}}$ (b) $\frac{1}{\sqrt{10}}$
(c) $\frac{4}{\sqrt{10}}$ (d) None of these

19. Equation of the hour hand at 4 O' clock is
(a) $x-\sqrt{3}y=0$ (b) $\sqrt{3}x-y=0$
(c) $x+\sqrt{3}y=0$ (d) $\sqrt{3}x+y=0$

20. If the image of point P(2, 3) in a line L is Q(4, 5), then the image of point R(0, 0) in the same line is:
(a) (2,2) (b) (4, 5)
(c) (3,4) (d) (7, 7)

21. The coordinates of a point which is at +3 distance from points (1, –3) of line $2x+3y+7=0$ is
(a) $\left(1-\frac{9}{\sqrt{13}}, -3+\frac{6}{\sqrt{13}}\right)$ (b) $\left(1+\frac{9}{\sqrt{13}}, 1-\frac{9}{\sqrt{13}}\right)$
(c) $\left(3-\frac{6}{\sqrt{13}}, 3+\frac{6}{\sqrt{13}}\right)$ (d) $\left(1+\frac{9}{\sqrt{13}}, -3-\frac{6}{\sqrt{13}}\right)$

22. If one of the diagonals of a square is along the line x = 2y and one of its vertices is (3, 0), then its sides through this vertex are given by the equations
(a) $y-3x+9=0,\ 3y+x-3=0$
(b) $y+3x+9=0,\ 3y+x-3=0$
(c) $y-3x+9=0,\ 3y-x+3=0$
(d) $y-3x+3=0,\ 3y+x+9=0$

23. Given a family of lines $a(2x+y+4)+b(x-2y-3)=0$, the number of lines belonging to the family at a distance $\sqrt{10}$ from P(2, –3) is
(a) 0 (b) 1
(c) 2 (d) 4

24. The line parallel to the x- axis and passing through the intersection of the lines $ax+2by+3b=0$ and $bx-2ay-3a=0$, where $(a, b) \neq (0, 0)$ is
(a) below the x - axis at a distance of $\frac{3}{2}$ from it
(b) below the x - axis at a distance of $\frac{2}{3}$ from it
(c) above the x - axis at a distance of $\frac{3}{2}$ from it
(d) above the x - axis at a distance of $\frac{2}{3}$ from it

RESPONSE GRID					
	15. ⓐⓑⓒⓓ	**16.** ⓐⓑⓒⓓ	**17.** ⓐⓑⓒⓓ	**18.** ⓐⓑⓒⓓ	**19.** ⓐⓑⓒⓓ
	20. ⓐⓑⓒⓓ	**21.** ⓐⓑⓒⓓ	**22.** ⓐⓑⓒⓓ	**23.** ⓐⓑⓒⓓ	**24.** ⓐⓑⓒⓓ

Space for Rough Work

25. The equation

$8x^2 + 8xy + 2y^2 + 26x + 13y + 15 = 0$ represents a pair of straight lines. The distance between them is

(a) $7/\sqrt{5}$ (b) $7/2\sqrt{5}$

(c) $\sqrt{7}/5$ (d) None of these

26. A straight line L through the point (3, –2) is inclined at an angle 60° to the line $\sqrt{3}x + y = 1$. If L also intersects the x-axis, then the equation of L is

(a) $y + \sqrt{3}x + 2 - 3\sqrt{3} = 0$ (b) $y - \sqrt{3}x + 2 + 3\sqrt{3} = 0$

(c) $\sqrt{3}y - x + 3 + 2\sqrt{3} = 0$ (d) $\sqrt{3}y + x - 3 + 2\sqrt{3} = 0$

27. The equation of a straight line, which passes through the point (a, 0) and whose perpendicular distance from the point (2a, 2a) is a, is

(a) $3x - 4y - 3a = 0$ (b) $x - a = 0$

(c) both (a) and (b) (d) Neither of (a) and (b)

28. The points (1,3) and (5,1) are two opposite vertices of a rectangle. The other two vertices lie on the line $y = 2x + c$, then one of the remaining vertices is

(a) (4,4) (b) (2,2)

(c) (0,2) (d) (4,2)

29. (sin θ, cos θ) and (3, 2) lies on the same side of the line $x + y = 1$, then θ lies between

(a) $(0, \pi/2)$ (b) $(0, \pi)$

(c) $(\pi/4, \pi/2)$ (d) $(0, \pi/4)$

30. The perpendicular distance between the straight lines $6x + 8y + 15 = 0$ and $3x + 4y + 9 = 0$ is

(a) $\frac{3}{2}$ units (b) $\frac{3}{10}$ unit

(c) $\frac{3}{4}$ unit (d) $\frac{2}{7}$ unit

RESPONSE GRID	25. ⓐⓑⓒⓓ 26. ⓐⓑⓒⓓ 27. ⓐⓑⓒⓓ 28. ⓐⓑⓒⓓ 29. ⓐⓑⓒⓓ 30. ⓐⓑⓒⓓ

DAILY PRACTICE PROBLEM DPP CHAPTERWISE 10 - MATHEMATICS			
Total Questions	30	Total Marks	120
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	38	Qualifying Score	55
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

Space for Rough Work