REV-EOSL-2324-ASM-SET 1-MATH
Suggested solutions

Multiple Choice Questions

1. D	2. D	3. A	4. D	5. A
6. C	7. D	8. C	9. C	10. C
11. B	12. A	13. D	14. C	15. C
16. A	17. B	18. B	19. B	20. B
21. C	22. D	23. D	24. A	25. A
26. D	27. A	28. A	29. D	30. B

1. D

$5(6) - 8y - 14 = 0$ and $5x - 8(-3) - 14 = 0$

$y = 2$ $x = -2$

The coordinates of A and C are $(-2,\ -3)$ and $(6,\ 2)$ respectively.

Required area $= (6 + 2)(2 + 3)$

$= 40$ sq. units

2. D

Let $A\ (a,\ 1)$ and $B\ (2,\ b)$. Substitute them into $y = 2x + 3$, we have $a = -1$ and $b = 7$.

Distance between A and $B = \sqrt{(2 + 1)^2 + (7 - 1)^2} = \sqrt{45} = 3\sqrt{5}$

3. A

Slope required line $= \dfrac{-1}{2}$

Required equations is

$$y = \frac{-1}{2}x$$

$$x + 2y = 0$$

4. D

Slope of $L_1 = \tan 30° = \dfrac{1}{\sqrt{3}}$

Slope of $L_2 = -\sqrt{3}$

Equation of L_2 is

$$y = -\sqrt{3}x$$

$$\sqrt{3}x + y = 0$$

5. A

Slope of $L_1 = \dfrac{4-0}{-1-0} = -4$

Slope of $L_2 = \dfrac{1}{4}$

Required equation is

$$y - 4 = \frac{1}{4}(x+1)$$

$$x - 4y + 17 = 0$$

6. C

Let the x-intercept be a. Then the y-intercept is also a.

Slope of the line $= \dfrac{a-0}{0-a} = -1$

Required equation is

$$y - 5 = -1(x-3)$$

$$x + y - 8 = 0$$

7. D

The coordinates of the mid-point of AB are $\left(-1,\ \dfrac{11}{2}\right)$.

Slope of $AB = \dfrac{8-3}{-4-2} = -\dfrac{5}{6}$

Required equation is

$$y - \frac{11}{2} = \frac{6}{5}(x+1)$$

$$12x - 10y + 67 = 0$$

8. C

Slope of $L_1 = -\tan 30° = -\dfrac{1}{\sqrt{3}}$

Slope of $L_2 = \sqrt{3}$

Required equation is

$$y - 0 = \sqrt{3}(x+1)$$

$$\sqrt{3}x - y + \sqrt{3} = 0$$

9. C

Slope of $L = -\tan 45° = -1$

Required equation is

$$y - 0 = -1(x+3)$$

$$x + y + 3 = 0$$

10. C

The coordinates of mid-point of BD are $(4,\ 6)$.
Slope of $BD = \dfrac{9-3}{5-3} = 3$
Required equation is

$$y - 6 = -\frac{1}{3}(x - 4)$$
$$x + 3y - 22 = 0$$

11. B

Since $OA = AB$, we have $\angle AOB = \angle ABO$ and slope of OA is $-m$.
Required equation is

$$y = -mx$$
$$mx + y = 0$$

12. A

mid-point of BC is at $(7,\ 5)$. Required straight line passes through A and $(7,\ 5)$.
Slope of the line $= \dfrac{5-3}{7-3} = \dfrac{1}{2}$.
Only the line in option A has slope $\dfrac{1}{2}$.

13. D

Slope $= \dfrac{7-3}{0+2} = 2$
Required equation is

$$y - 7 = 2(x - 0)$$
$$y = 2x + 7$$

14. C

Slope $= \dfrac{4+7}{-6+2} = -\dfrac{11}{4}$
Required equation is

$$y - 4 = -\frac{11}{4}(x + 6)$$
$$11x + 4y + 50 = 0$$

15. C

Let the coordinates of P be $(p,\ 0)$.

$$\frac{-3-0}{3-p} = \frac{1+3}{7-3}$$

$$p = 6$$

Slope of required line $= \frac{3-0}{0-6} = -\frac{1}{2}$

Required equation is

$$y - 3 = -\frac{1}{2}(x - 0)$$

$$x + 2y - 6 = 0$$

16. A

Let the coordinates of P be $(p,\ p)$ such that P lies on the straight line $x = y$.

$$AP = PB$$

$$\sqrt{(p-2)^2 + (p-5)^2} = \sqrt{(p-6)^2 + (p+3)^2}$$

$$2p^2 - 14p + 29 = 2p^2 - 6p + 45$$

$$p = -2$$

The coordinates of P are $(-2,\ -2)$.

17. B

Let the coordinates of P be $(p,\ p+1)$ such that P lies on $y = x + 1$.

$$AP = PB$$

$$\sqrt{(p-3)^2 + (p+1-9)^2} = \sqrt{(p-7)^2 + (p+1-1)^2}$$

$$2p^2 - 22p + 73 = 2p^2 - 14p + 49$$

$$p = 3$$

The coordinates of P are $(3,\ 4)$.

18. B

Let the coordinates of C be $(2c,\ c)$ such that it lies on $x - 2y = 0$.

$$\sqrt{(9-2c)^2 + (-2-c)^2} = \sqrt{(-1-2c)^2 + (8-c)^2}$$

$$-20c + 20 = 0$$

$$c = 1$$

The x-coordinate of C is 2.

19. B

$A\ (0,\ 2)$ and $B\ (-6,\ 0)$.

Area $= \frac{(2)(6)}{2} = 6$

20. B

Required equation is in the form $3x + 4y + k = 0$, where k is a constant.

The answer is B.

21. C

$5(0) - 8y - 40 = 0$ and $5x - 8(0) - 40 = 0$

$y = -5$ $x = 8$

The coordinates of A and B are $(8,\ 0)$ and $(0,\ -5)$ respectively.

The coordinates of M are $(4,\ 0)$.

Slope of $L_2 = \dfrac{0+5}{4-0} = \dfrac{5}{4}$

Required equation is

$$y + 5 = \frac{5}{4}(x - 0)$$

$$5x - 4y - 20 = 0$$

22. D

The slopes of the lines are $-\dfrac{1}{3}$ and $\dfrac{k}{3}$ respectively.

$$-\frac{1}{3} \times \frac{k}{3} = -1$$

$$k = 9$$

23. D

$$\frac{x}{2} + \frac{y}{3} = 1$$

$$y = -\frac{3x}{2} + 3$$

Slope of required line is $\dfrac{2}{3}$.

The answer is D.

24. A

L_1: $y = -\dfrac{3x}{2} + \dfrac{3}{4} \quad \Rightarrow \quad \text{slope} = -\dfrac{3}{2}$

L_2: $y = -\dfrac{3x}{2} + 4 \quad \Rightarrow \quad \text{slope} = -\dfrac{3}{2}$

L_3: $y = \dfrac{3x}{2} + \dfrac{3}{4} \quad \Rightarrow \quad \text{slope} = \dfrac{3}{2}$

I. ✓. Equal slopes.

II. ✗. Different slopes.

III. ✗. Product of slope $= -\dfrac{3}{2} \times \dfrac{3}{2} = -\dfrac{9}{4} \neq -1$

25. A

$$\frac{-3}{2} \times \frac{-k}{12} = -1$$

$$k = -8$$

26. D

$$\frac{-k}{4} \times \frac{6}{9} = -1$$

$$k = 6$$

L: $6x + 4y - 12 = 0$. The y-intercept is 3.

27. A

Slope of the line $= \frac{9}{5}$

Slope of $L = -\frac{5}{9}$

Equation of L is

$$y - 3 = -\frac{5}{9}(x + 3)$$

$$5x + 9y + 15 = 0$$

28. A

Required equation is in the form $3x - 5y + C = 0$, where C is a constant.

$$3(k) - 5(-k) + C = 0$$

$$C = -8k$$

Required equation is $4x - 5y - 8k = 0$.

29. D

Slope of $x + 2y + 3 = 0$ is $-\frac{1}{2}$.

Required equation is

$$y - 3 = 2(x - 1)$$

$$2x - y + 1 = 0$$

30. B

Take $a = b = 1$ and $c = -1$.

$ax + by + c = 0$

$$x + y - 1 = 0$$

$$y = -x + 1$$

The graph is a straight line with slope -1 and y-intercept 1.

The answer is B.

 END OF PAPER