

Episode No.15

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Topic-3 DIMENSIONAL GEOMETRY

1) The distance of the point P(a,b,c) from the x-axis is

- a) $\sqrt{a^2 + b^2}$ b) $\sqrt{b^2 + c^2}$ c) a d) $\sqrt{a^2 + c^2}$

Correct Option: (b)

2) Equation of the line passing through (2,-1,1) and parallel to the line $\frac{x-5}{4} = \frac{y+2}{-3} = \frac{z}{5}$ is

- a) $\frac{x-2}{-4} = \frac{y-1}{3} = \frac{z+1}{5}$ b) $\frac{x+2}{-4} = \frac{y+1}{-3} = \frac{z-1}{-5}$
c) $\frac{x+2}{-4} = \frac{-y+1}{3} = \frac{z+1}{-5}$ d) $\frac{x-2}{4} = \frac{y+1}{-3} = \frac{z-1}{5}$

Correct Option: (d)

3) The equation of the straight line making angles $60^\circ, 60^\circ$ and 45° with positive direction of the co-ordinate axes and passing through the point (2,1,-1) is

- a) $\sqrt{2}(x-2) = \sqrt{2}(y-1) = z+1$ b) $(x-2) = \sqrt{2}(y-1) = z+1$
c) $\sqrt{2}(x-2) = (y-1) = z+1$ d) $\sqrt{2}(x-2) = (y-1) = \sqrt{2}(z+1)$

Correct Option: (a)

4) The lines $\frac{x-1}{1} = \frac{y+3}{-3} = \frac{z-6}{6}$ and $\frac{x+1}{-1} = \frac{y-1}{1} = \frac{z-6}{6}$ intersect at

- a) (1, -3, 6) b) (-1, 1, 6) c) (0, 0, 0) d) no point

Correct Option: (c)

5) If the lines $\frac{x-1}{2} = \frac{y+1}{3} = \frac{z-1}{4}$ and $\frac{x-3}{1} = \frac{y-k}{2} = \frac{z}{1}$ intersect then K is equal to

- a) $\frac{9}{2}$ b) 0 c) -1 d) $\frac{2}{9}$

Correct Option: (a)

6) The angle between two lines $\frac{x}{2} = \frac{y}{2} = \frac{z}{-1}$ and $\frac{x-1}{1} = \frac{y-1}{2} = \frac{z-1}{2}$ is

- a) $\cos^{-1}\left(\frac{4}{9}\right)$ b) $\cos^{-1}\left(\frac{1}{3}\right)$ c) $\cos^{-1}\left(\frac{2}{9}\right)$ d) $\cos^{-1}\left(\frac{5}{9}\right)$

Correct Option: (a)

7) If the lines $\frac{x-1}{-3} = \frac{y-2}{2k} = \frac{z-3}{2}$, $\frac{x-1}{3k} = \frac{y-5}{1} = \frac{z-6}{-5}$ are at right angles, then k =

- a) -10 b) $\frac{10}{7}$ c) $\frac{-10}{7}$ d) $\frac{-7}{10}$

Correct Option: (c)

8) The equation of the plane through (1,2,3) and parallel to the plane $2x+3y-4z=0$ is

- a) $2x+3y+4z=4$ b) $2x+3y+4z+4=0$ c) $2x-3y+4z+4=0$ d) $2x+3y-4z+4=0$

Correct Option: (d)

9) The equation of the perpendicular from the point (α, β, γ) to the plane $ax+by+cz+d=0$

- a) $a(x-\alpha) + b(y-\beta) + c(z-\gamma) = 0$ b) $\frac{(x-\alpha)}{a} = \frac{(y-\beta)}{b} = \frac{(z-\gamma)}{c}$
c) $a(x-\alpha) + b(y-\beta) + c(z-\gamma) = abc$ d) $\frac{(x+\alpha)}{a} = \frac{(y+\beta)}{b} = \frac{(z+\gamma)}{c}$

Correct Option: (b)

10) The equation of a plane which passes through (2,-3,1) and is normal to the line joining the points (3,4,-1) and (2,-1,5) is given by

- a) $x+5y-6z+19=0$ b) $x-5y+6z-19=0$
c) $x+5y+6z+19=0$ d) $x-5y-6z-19=0$

Correct Option: (a)

11) Foot of the perpendicular drawn from the origin to the plane $2x-3y+4z=29$ is

- a) (5,-1,4) b) (2,-3,4) c) (7,-1,3) d) (5,-2,3)

Correct Option: (b)

- 12) The vector equation of the plane which is at a distance of $\frac{3}{\sqrt{14}}$ from the origin and the normal from the origin is $2i-3j+k$ is
- a) $\vec{r} \cdot (2i - 3j + k) = 3$ b) $\vec{r} \cdot (i + j + k) = 9$
- c) $\vec{r} \cdot (i + 2j) = 3$ d) $\vec{r} \cdot (2i + k) = 3$
- Correct Option: (a)

- 13) The value of 'k' for which the planes $3x-6y-2z=7$ and $2x+y-kz=5$ are perpendicular to each other is
- a) 0 b) 1 c) 2 d) 3
- Correct Option: (a)

- 14) A plane makes intercepts -6,3,4 upon the co-ordinate axes, then the length of the perpendicular from the origin on it is
- a) $\frac{2}{\sqrt{29}}$ b) $\frac{3}{\sqrt{29}}$ c) $\frac{4}{\sqrt{29}}$ d) $\frac{12}{\sqrt{29}}$
- Correct Option: (d)

- 15) Foot of the perpendicular drawn from the origin to the plane passing through $(1, 0, 0)$, $(0, 1, 0)$ and $(0, 0, 1)$ is
- a) (3,3,3) b) $(\frac{1}{2}, \frac{1}{2}, \frac{1}{2})$ c) $(\frac{1}{3}, \frac{1}{3}, \frac{1}{3})$ d) (2, -1, 0)
- Correct Option: (c)

- 16) The ratio in which the plane $x-2y+3z=17$ divides the line joining the points $(-2,4,7)$ and $(3,-5,8)$ is
- a) 10:3 b) 3:1 c) 3:10 d) 10:1
- Correct Option: (c)

- 17) The ratio in which the xy-plane divides the join of points $(-2, 4, 5)$, $(6, 5, 9)$ is
- a) 5:9 b) 9:5 c) -9:5 d) -5:9
- Correct Option: (d)

- 18) Equation of the plane perpendicular to the line $\frac{x}{1} = \frac{y}{2} = \frac{z}{3}$ and passing through the point (2,3,4) is
- a) $2x+3y+z=17$ b) $x+2y+3z=9$ c) $3x+2y+z=16$ d) $x+2y+3z=20$

Correct Option: (d)

- 19) The line $\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-4}{5}$ is parallel to the plane
- a) $2x+3y+4z=0$
 b) $3x+4y+5z=7$ c) $2x+y-2z=0$ d) $x+y+z=2$

Correct Option: (c)

- 20) The value of k such that $\frac{x-4}{1} = \frac{y-2}{1} = \frac{z-k}{2}$ lies in the plane $2x - 4y + z = 7$ is

- a) 7 b) -7 c) no real value d) 4

Correct Option: (a)

- 21) The distance between the line $\vec{r} = (\hat{i} + \hat{j} + 2\hat{k}) + \lambda(2\hat{i} + 5\hat{j} + 3\hat{k})$ and the plane $\vec{r} \cdot (2\hat{i} + \hat{j} - 3\hat{k}) = 5$ is

- a) $\frac{5}{\sqrt{1}}$ b) $\frac{6}{\sqrt{1}}$ c) $\frac{7}{\sqrt{1}}$ d) $\frac{8}{\sqrt{1}}$

Correct Option: (d)

- 22) The line $\frac{x-2}{3} = \frac{y-3}{4} = \frac{z-4}{5}$

- a) lies in $3x+2y+6z-12=0$ b) is parallel to $2x+y-2z=11$
 c) is perpendicular to $4x+7y+6z=0$ d) passes through (-2, -3, -4)

Correct Option: (b)

- 23) A plane which passes through the point (3, 2, 0) and the line $\frac{x-4}{1} = \frac{y-7}{5} = \frac{z-4}{4}$ is

- a) $x-y+z=1$ b) $x+y+z=5$ c) $x+2y-z=1$ d) $2x-y+z=5$

Correct Option: (a)

- 24) The angle between the line $\frac{x-1}{2} = \frac{y-2}{1} = \frac{z+3}{-2}$ and the plane $x+y+4z=0$ is

- a) 0° b) 30° c) 45° d) 90°

Correct Option: (c)

25) The distance of the point (1, -5, 9) from the plane $x-y+z=5$ measured along the line $x=y=z$ is

- (a) $3\sqrt{3}$ (b) $\sqrt{3}$ (c) $\frac{1}{3}$ (d) $\frac{2}{3}$

Correct Option: (b)

26) If the line, $\frac{x-3}{2} = \frac{y+2}{-1} = \frac{z+4}{3}$ lies in the plane, $lx+my-z=9$ then $l^2 + m^2$ is equal to

- (a) 26 (b) 18 (c) 5 (d) 2

Correct Option: (d)