THREE DIMENSIONAL GEOMETRY

ANGLE BETWEEN TWO LINES

EXERCISE

Q.1 Determine the angle between the pair of lines.

$$\frac{x-3}{5}=\frac{y+7}{3}=\frac{z-2}{2} \text{ and } \frac{x+1}{3}=\frac{y-5}{4}=\frac{z+2}{8}$$

(A) $\cos^{-1}\frac{43}{\sqrt{3482}}$ (B) $\cos^{-1}\frac{43}{\sqrt{3382}}$

(C) $\cos^{-1}\frac{85}{\sqrt{3382}}$ (D) $\cos^{-1}\frac{34}{\sqrt{3382}}$

Q.2 Determine the value of p for which the lines...

$\frac{x+11}{4}=\frac{y+3}{-2}=\frac{z-3}{4}$ and $\frac{x-3}{p}=\frac{y+12}{2}=\frac{z-3}{-12}$ are at right angles to each other.

(A) $p = 11$ (B) $P = 12$ (C) $P = 13$ (D) $P = 4$

Q.3 Determine the angle between the two lines given their equations.

$\vec{r}=\hat{i}+\hat{j}+\hat{k}+\lambda(3\hat{i}-\hat{j}+\hat{k})$ and $\vec{r}=4\hat{i}+\hat{j}-2\hat{k}+\mu(2\hat{i}+3\hat{j}+\hat{k})$

(A) $\cos^{-1}\frac{4}{\sqrt{14}}$ (B) $\cos^{-1}\frac{\sqrt{14}}{\sqrt{154}}$

(C) $\cos^{-1}\frac{4}{154}$ (D) $\cos^{-1}\frac{4}{\sqrt{154}}$

Q.4 Determine the value of p for which the lines... $\frac{x-1}{3}=\frac{y+4}{p}=\frac{z-9}{1}$ and

$\frac{x+2}{1}=\frac{y-3}{1}=\frac{z-7}{-2}$ are at right angles to each other.

(A) $p = 2$ (B) $p = 1$ (C) $p = -1$ (D) $p = -2$

ANSWER KEY

1. (B) $\cos^{-1}\frac{43}{\sqrt{3382}}$

2. (C) $P = 13$

3. (D) $\cos^{-1}\frac{4}{\sqrt{154}}$

4. (C) $p = -1$