Class 12 Mathematics · Chapter 11: Three Dimensional Geometry

Worksheet · 20 marks · about 40 minutes · based on NCERT

Name _____ Class and section _____ Date _____

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1. The line joining the origin O to the point P(1, 1, √2) makes with the positive direction of the z-axis an angle of [1]

(a) 60°
(b) 45°
(c) 30°
(d) 90°

2. The line $\vec{r} = 3\hat{i} - 2\hat{k} + \lambda\hat{j}$ [1]

(a) is perpendicular to the y-axis and passes through (3, 0, −2)
(b) is parallel to the y-axis and passes through the origin
(c) is parallel to the vector $3\hat{i} - 2\hat{k}$ and passes through (0, 1, 0)
(d) is parallel to the y-axis and passes through the point (3, 0, −2)

3. Two lines in space that are neither parallel nor intersecting are called [1]

(a) coplanar lines
(b) skew lines
(c) concurrent lines
(d) perpendicular lines

4. If 2k, −k and 2k are the direction cosines of a line, where k > 0, then k is [1]

(a) $\frac{1}{3}$
(b) $\frac{1}{9}$
(c) $\frac{1}{\sqrt{3}}$
(d) 3

5. A line has direction ratios 2, −3, 6. Which of the following is NOT a set of direction ratios of the same line? [1]

(a) −4, 6, −12
(b) $1, -\frac{3}{2}, 3$
(c) −2, −3, −6
(d) 6, −9, 18

6. The points A(−1, 2, 1), B(1, a, 5) and C(5, 11, b) are collinear. Find a and b. [2]

7. For the line $\frac{x-1}{2} = \frac{y+3}{-1} = \frac{z-4}{-2}$, find (a) its direction cosines, (b) the point on it whose z-coordinate is 0. [2]

8. Find the acute angle between the line $\frac{x-4}{2} = \frac{1-y}{2} = \frac{z}{1}$ and the y-axis. [2]

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9. Find k for which the line through A(1, 0, −1) and B(2, 1, 1) meets the line through C(0, 2, 1) and D(1, 2, k), and find the point where they meet. [3]

10. Show that the lines $\frac{x-1}{2} = \frac{y+1}{3} = \frac{z-2}{-1}$ and $\frac{x-2}{1} = \frac{y-4}{-2} = \frac{z+2}{3}$ intersect, and find their point of intersection. [3]

11. The vertices of a triangle are A(3, 3, 1), B(1, 2, 3) and C(3, 2, 5). Using direction ratios, show that the triangle is right-angled at B, and find cos A. [3]