

Vectors in Space

1. Describe the set of points (x, y, z) defined by the equation
(Similar to p.364 #7-14)

$$x = 2$$

2. Describe the set of points (x, y, z) defined by the equation
(Similar to p.364 #7-14)

$$y = 5$$

3. Describe the set of points (x, y, z) defined by the equation(s)
(Similar to p.364 #7-14)

$$x = 2 \quad z = 3$$

4. Find the distance from P_1 to P_2
(Similar to p.364 #15-20)

$$P_1 = (3, -1, 5) \text{ and } P_2 = (7, 1, 2)$$

5. Opposite vertices of a rectangular box whose edges are parallel to the coordinate axes are given. List the coordinates of the other six vertices of the box

(Similar to p.364 #21-26)

$$(0, 0, 0); (4, 2, 1)$$

6. The vector \mathbf{v} has initial point P and terminal point Q. Write \mathbf{v} in the form $a\mathbf{i} + b\mathbf{j} + c\mathbf{k}$; that is, find its position vector.

(Similar to p.364 #27-32)

$$P = (-2, 1, 3); \quad Q = (5, 7, -4)$$

7. Find $\|\mathbf{v}\|$
(Similar to p.364 #33-38)

$$\mathbf{v} = 2\mathbf{i} - 5\mathbf{j} + 3\mathbf{k}$$

8. Find each quantity if $\mathbf{v} = 4\mathbf{i} + \mathbf{j} - 2\mathbf{k}$
and $\mathbf{w} = -3\mathbf{i} - \mathbf{j} - 4\mathbf{k}$
(Similar to p.364 #39-44)

$$2\mathbf{v} - 5\mathbf{w}$$

9. Find each quantity if $\mathbf{v} = 4\mathbf{i} + \mathbf{j} - 2\mathbf{k}$
and $\mathbf{w} = -3\mathbf{i} - \mathbf{j} - 4\mathbf{k}$
(Similar to p.364 #39-44)

$$\|\mathbf{v}\| + \|\mathbf{w}\|$$

10. Find the unit vector in the same direction as \mathbf{v}
(Similar to p.365 #45-50)

$$\mathbf{v} = 5\mathbf{i} - \mathbf{j} + 2\mathbf{k}$$

11. Find the dot product $\mathbf{v} \cdot \mathbf{w}$ and the angle between \mathbf{v} and \mathbf{w}
(Similar to p.365 #51-58)

$$\mathbf{v} = \mathbf{i} + \mathbf{k} \quad \mathbf{w} = -\mathbf{i} - \mathbf{j} + \mathbf{k}$$

12. Find the dot product $\mathbf{v} \cdot \mathbf{w}$ and the angle between \mathbf{v} and \mathbf{w}
(Similar to p.365 #51-58)

$$\mathbf{v} = 2i - 3j + k \quad \mathbf{w} = i - 4j + 2k$$

13. Find the direction angles of each vector.
(Similar to p.365 #59-66)

$$\mathbf{v} = i + k$$

14. Find the direction angles of each vector.
(Similar to p.365 #59-66)

$$\mathbf{v} = 2i + j - 3k$$