

Assignment: Vector

Write each vector in component form.

1) \overrightarrow{CD} where $C = (1, 7, 6)$ $D = (-1, -4, 4)$

2) \overrightarrow{RS} where $R = (-5, 2, -6)$ $S = (4, -2, 7)$

3) \overrightarrow{AB} where $A = (9, 1, -1)$ $B = (-4, 6, 0)$

4) \overrightarrow{RS} where $R = (6, -2, -2)$ $S = (-1, -6, -5)$

Express the resultant vector as a linear combination of unit vectors \mathbf{i} , \mathbf{j} , and \mathbf{k} .

5) $\mathbf{f} = 2\mathbf{i} - \mathbf{j} + 4\mathbf{k}$
 $\mathbf{g} = -4\mathbf{i} + 7\mathbf{j} + 3\mathbf{k}$
Find: $3\mathbf{f} - 2\mathbf{g}$

6) $\mathbf{f} = 5\mathbf{j} - \mathbf{k}$
 $\mathbf{g} = 4\mathbf{i} - \mathbf{j} + 7\mathbf{k}$
Find: $4\mathbf{f} - 7\mathbf{g}$

Find the dot product of the given vectors.

7) $\mathbf{u} = -9\mathbf{i} - \mathbf{j}$
 $\mathbf{v} = 4\mathbf{i} + 2\mathbf{j}$

8) $\mathbf{u} = -7\mathbf{i} - 5\mathbf{j}$
 $\mathbf{v} = 2\mathbf{i} - 3\mathbf{j}$

9) $\mathbf{u} = -8\mathbf{i} + \mathbf{j}$
 $\mathbf{v} = 5\mathbf{i}$

10) $\mathbf{u} = 3\mathbf{i} + 6\mathbf{j}$
 $\mathbf{v} = 7\mathbf{i} + \mathbf{j}$

State if the two vectors are parallel, orthogonal, or neither.

11) $\mathbf{u} = -16\mathbf{i} - 12\mathbf{j}$
 $\mathbf{v} = -3\mathbf{i} + 4\mathbf{j}$

12) $\mathbf{u} = -4\mathbf{i} - 9\mathbf{j}$
 $\mathbf{v} = -6\mathbf{i} + 15\mathbf{j}$

Find the measure of the angle between the two vectors.

13) $\mathbf{u} = 7\mathbf{i} + 4\mathbf{j}$
 $\mathbf{v} = -4\mathbf{i} + 6\mathbf{j}$

14) $\mathbf{u} = -9\mathbf{i} - 4\mathbf{j}$
 $\mathbf{v} = -2\mathbf{i} - 5\mathbf{j}$

15) $\mathbf{u} = -4\mathbf{i} - 4\mathbf{j}$
 $\mathbf{v} = 2\mathbf{i} + 7\mathbf{j}$

16) $\mathbf{u} = \mathbf{i} + 5\mathbf{j}$
 $\mathbf{v} = 7\mathbf{j}$

Answers to Assignment: Vector

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|--|--|--------------------------------|---------------------------------|
| 1) $\langle -2, -11, -2 \rangle$ | 2) $\langle 9, -4, 13 \rangle$ | 3) $\langle -13, 5, 1 \rangle$ | 4) $\langle -7, -4, -3 \rangle$ |
| 5) $14\mathbf{i} - 17\mathbf{j} + 6\mathbf{k}$ | 6) $-28\mathbf{i} + 27\mathbf{j} - 53\mathbf{k}$ | 7) -38 | 8) 1 |
| 9) -40 | 10) 27 | 11) <i>Orthogonal</i> | 12) <i>Neither</i> |
| 13) 93.95° | 14) 44.24° | 15) 150.95° | 16) 11.31° |

