SATPREP Name_____

Assignment: Vector(Basic)

Date_____

Write each vector in component form and as a linear combination, if not provided. Then find the magnitude.

1) $\overrightarrow{PQ}$ where $P = (8, 4, 2)$ $Q = (-2, 7, -4)$

2) $\overrightarrow{PQ}$ where $P = (4, 8, 2)$ $Q = (-2, -1, 6)$

3) $\overrightarrow{RS}$ where $R = (9, -6, -3)$ $S = (-1, 0, 5)$

4) $\overrightarrow{CD}$ where $C = (-5, -2, 0)$ $D = (-2, 6, 1)$

Find the component form of the resultant vector.

5) $\mathbf{u} = \langle -8, 5, 8 \rangle$
Find: Unit vector in the direction of $\mathbf{u}$

6) Given: $A = (-5, 1, -9)$ $B = (1, 9, 3)$
Find: Unit vector in the direction of $\overrightarrow{AB}$

Find the dot product of the given vectors.

7) $\mathbf{u} = 8\mathbf{i} + 4\mathbf{j}$
$\mathbf{v} = 6\mathbf{i} - 2\mathbf{j}$

8) $\mathbf{u} = 8\mathbf{i} - 6\mathbf{j}$
$\mathbf{v} = -\mathbf{i}$

Find the measure of the angle between the two vectors.

9) $\mathbf{u} = -4\mathbf{i} + \mathbf{j}$
$\mathbf{v} = -\mathbf{i} - 3\mathbf{j}$

10) $\mathbf{u} = -6\mathbf{i} - 2\mathbf{j}$
$\mathbf{v} = -6\mathbf{i} - 3\mathbf{j}$

Answers to Assignment: Vector(Basic)

1) $\langle -10, 3, -6 \rangle$
$-10\mathbf{i} + 3\mathbf{j} - 6\mathbf{k}$
$\sqrt{145} \approx 12.042$

2) $\langle -6, -9, 4 \rangle$
$-6\mathbf{i} - 9\mathbf{j} + 4\mathbf{k}$
$\sqrt{133} \approx 11.533$

3) $\langle -10, 6, 8 \rangle$
$-10\mathbf{i} + 6\mathbf{j} + 8\mathbf{k}$
$10\sqrt{2} \approx 14.142$

4) $\langle 3, 8, 1 \rangle$
$3\mathbf{i} + 8\mathbf{j} + \mathbf{k}$
$\sqrt{74} \approx 8.602$

5) $\left\langle -\frac{8\sqrt{17}}{51}, \frac{5\sqrt{17}}{51}, \frac{8\sqrt{17}}{51} \right\rangle$

6) $\left\langle \frac{3\sqrt{61}}{61}, \frac{4\sqrt{61}}{61}, \frac{6\sqrt{61}}{61} \right\rangle$

7) 40

8) -8

9) 85.6°

10) 8.13°