

Math 233 - Quiz 2

January 26, 2023

Name _____

Score _____

Show all work to receive full credit. Supply explanations when necessary.

1. (4 points) In each part of this problem, you are given information about \vec{x} and \vec{y} . Determine whether the angle between \vec{x} and \vec{y} is acute, right, or obtuse. Explain as necessary.

(a) $\vec{x} \cdot \vec{y} = -17$

(b) $\vec{x} = 3\hat{i} - 7\hat{j} + 5\hat{k}$ and $\vec{y} = 4\hat{i} + \hat{j} - \hat{k}$

(c) $\frac{\vec{x} \cdot \vec{y}}{\|\vec{x}\| \|\vec{y}\|} = \frac{\sqrt{3}}{2}$

2. (3 points) Determine the measure of the angle between the vectors $\vec{a} = 3\hat{i} + 4\hat{j} - 9\hat{k}$ and $\vec{b} = 2\hat{j} + 8\hat{k}$. Write your final answer in degrees, rounded to the nearest hundredth.

3. (3 points) Show that these points are collinear.

$$P(3, -2, 1), \quad Q(0, 7, -14), \quad R(5, -8, 11)$$