

Math 233 - Quiz 1

August 20, 2026

Name _____

Score _____

Show all work to receive full credit. Supply explanations when necessary. This quiz is due August 25.

1. (4 points) Let $\vec{w}$ be the vector from $A(3, -5)$ to $B(6, 1)$.

(a) Find the component form of $\vec{w}$.

(b) Compute $\|\vec{w}\|$.

(c) Determine a vector of magnitude 10 with the same direction as $\vec{w}$.

(d) What angle does $\vec{w}$ make with the positive x -axis? Write your answer in degrees, rounded to the nearest tenth. (Do not use the dot product to solve this problem.)

2. (2 points) Let $\vec{u} = 4\hat{i} - 7\hat{j}$ and let $\vec{v}$ be the 2D vector of magnitude 5 that makes a 225° angle with the positive x -axis. Compute $2\vec{u} - \vec{v}$ and then find its magnitude.

Turn over.

3. (1 point) Use vectors to show that the points $P(8, -9, 8)$, $Q(2, 1, 0)$, and $R(-10, 21, -16)$ are collinear.
4. (1 point) Write an equation for the plane passing through $(5, 8, -7)$ that is parallel to the xy -plane.
5. (2 points) Let $\vec{a} = 3\hat{i} - \hat{j} + 2\hat{k}$ and let $\vec{b} = \vec{v} - \vec{w}$, where $\vec{v} = 2\hat{i} + \hat{j} + 4\hat{k}$ and $\vec{w} = 6\hat{i} + \hat{j} + 2\hat{k}$. Find the measure of the angle between $\vec{a}$ and $\vec{b}$. Write your answer in radians, rounded to the nearest hundredth.