Math 233 - Quiz 1

Name _____

August 24, 2023

Score _____

Show all work to receive full credit. Supply explanations when necessary. This quiz is due August 29.

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1. (1 point) The 2-dimensional vector $\vec{u}$ has magnitude 5 and makes a 225° with the positive x-axis. Write $\vec{u}$ in component form.

2. (4 points) Let $\vec{w}$ be the vector from $P\,(2,-1,-3)$ to $Q\,(-3,0,8)$.

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

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

   (c) Find a vector of magnitude 3 whose direction is opposite that of $\vec{w}$.

   (d) Compute $\|-5\vec{w}\|$.

Turn over.

3. (2 points) Determine whether the points $A\,(9, 6, 3)$, $B\,(-1, 1, 8)$, and $C\,(-11, -4, 13)$ are collinear.

4. (3 points) Let $\vec{x} = 3\hat{\imath} + \hat{\jmath}$ and $\vec{y} = -\hat{\imath} + \hat{\jmath}$. Compute $\vec{z} = 2\vec{x} + 3\vec{y}$, and then sketch $\vec{x}$, $\vec{y}$, and $\vec{z}$, illustrating how they are related by the parallelogram law.