

# Math 233 - Quiz 1

August 26, 2021

Name \_\_\_\_\_

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary. This quiz is due August 31.

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1. (5 points) Consider the points  $P(4, -3)$ ,  $Q(9, 2)$ , and  $R(-3, -5)$ .

(a) Find the component form of the vector  $2\vec{PQ} - \vec{PR}$ .

(b) If the initial point of  $\vec{QR}$  was placed at the point  $(8, 7)$ , what would be the terminal point?

(c) Compute  $\|\vec{PQ}\|$ .

(d) Determine the vector (in component form) of magnitude 7 whose direction is opposite that of  $\vec{PQ}$ .

(e) What angle does  $\vec{QR}$  make with the positive  $x$ -axis? Write your answer in degrees, rounded to the nearest tenth.

*Turn over.*

2. (2 points) Consider the points  $P(3, 1, -2)$  and  $Q(9, 2, 0)$  in 3-dimensional space. Let  $R$  be the midpoint of the line segment  $PQ$ . Determine  $R$  and then compute  $\|\vec{PR}\|$ .

3. (1 point) The 2-dimensional vector  $\vec{u}$  has magnitude 10 and makes a  $225^\circ$  angle with the positive  $x$ -axis. Write  $\vec{u}$  in terms of  $\hat{i}$  and  $\hat{j}$ .

4. (2 points) Determine the angle between  $\vec{u} = 3\hat{i} + 2\hat{j} - 5\hat{k}$  and  $\vec{w} = -8\hat{i} + 7\hat{k}$ . Write your answer in radians, rounded to the nearest hundredth.