Physics 4A
Spring 2025

Name _____

Lab: 8:00 am 11:15 am 2:30 pm (circle one)

Quiz #3: Vectors and Coordinate Systems

Problem 1 **(2 points)**

Three vectors $\vec{A}$, $\vec{B}$, and $\vec{C}$ add together to yield zero: $\vec{A} + \vec{B} + \vec{C} = 0$. The vectors $\vec{A}$ and $\vec{C}$ point in *opposite* directions and their magnitudes are related by the expression: $A = 2C$. Which one of the following conclusions is correct?

(a) $\vec{A}$ and $\vec{B}$ have equal magnitudes and point in opposite directions.
(b) $\vec{B}$ and $\vec{C}$ have equal magnitudes and point in the same direction.
(c) $\vec{B}$ and $\vec{C}$ have equal magnitudes and point in opposite directions.
(d) $\vec{A}$ and $\vec{B}$ point in the same direction, but $\vec{A}$ has twice the magnitude of $\vec{B}$.
(e) $\vec{B}$ and $\vec{C}$ point in the same direction, but $\vec{C}$ has twice the magnitude of $\vec{B}$.

Problem 2 (4 points)

Vector $\vec{A} = -1.00\hat{i} + -2.00\hat{j}$ and vector $\vec{B} = 3.00\,\hat{i} + 4.00\,\hat{j}$. What are the magnitude and direction of vector $\vec{C} = 3.00\vec{A} + 2.00\vec{B}$?

Problem 3 (4 points)

Two force vectors, $\vec{A}$ and $\vec{B}$, are shown below. Force $\vec{A}$ has a magnitude of 15.0 N and force $\vec{B}$ has a magnitude of 7.50 N. Find the magnitude and direction of $\vec{A} + \vec{B}$