1) Which of the following is an accurate statement?
A) The magnitude of a vector can be zero even though one of its components is not zero.
B) It is possible to add a scalar quantity to a vector.
C) Even though two vectors have unequal magnitudes, it is possible that their vector sum is zero.
D) Rotating a vector about an axis passing through the tip of the vector does not change the vector.
E) The magnitude of a vector is independent of the coordinate system used.
Answer: E
Var: 1

2) If $\vec{A} - \vec{B} = 0$, then the vectors $\vec{A}$ and $\vec{B}$ have equal magnitudes and are directed in the opposite directions from each other.
A) True
B) False
Answer: B
Var: 1

3) Under what condition is $|\vec{A} - \vec{B}| = A + B$?
A) The magnitude of vector $\vec{B}$ is zero.
B) Vectors $\vec{A}$ and $\vec{B}$ are in opposite directions.
C) Vectors $\vec{A}$ and $\vec{B}$ are in the same direction.
D) Vectors $\vec{A}$ and $\vec{B}$ are in perpendicular directions.
E) The statement is never true.
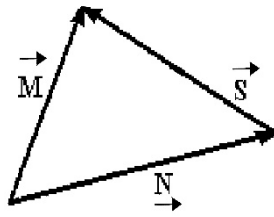Answer: B
Var: 1

4) If $A > B$, under what condition is $|\vec{A} - \vec{B}| = A - B$?
A) The statement is never true.
B) Vectors $\vec{A}$ and $\vec{B}$ are in opposite directions.
C) Vectors $\vec{A}$ and $\vec{B}$ are in the same direction.
D) Vectors $\vec{A}$ and $\vec{B}$ re in perpendicular directions.
E) The statement is always true.
Answer: C
Var: 1

5) For the vectors shown in the figure, express vector $\vec{S}$ in terms of vectors $\vec{M}$ and $\vec{N}$.

Answer: $\vec{S} = \vec{M} - \vec{N}$

Var: 1

6) The magnitude of a vector can never be less than the magnitude of one of its components.
A) True
B) False
Answer: A
Var: 1

7) If the magnitude of vector $\vec{A}$ is less than the magnitude of vector $\vec{B}$, then the x component of $\vec{A}$ is less than the x component of $\vec{B}$.
A) True
B) False
Answer: B
Var: 1

8) If the eastward component of vector $\vec{A}$ is equal to the westward component of vector $\vec{B}$ and their northward components are equal. Which one of the following statements about these two vectors is correct?
A) Vector $\vec{A}$ is parallel to vector $\vec{B}$.
B) Vectors $\vec{A}$ and $\vec{B}$ point in opposite directions.
C) Vector $\vec{A}$ is perpendicular to vector $\vec{B}$.
D) The magnitude of vector $\vec{A}$ is equal to the magnitude of vector $\vec{B}$.
E) The magnitude of vector $\vec{A}$ is twice the magnitude of vector $\vec{B}$.
Answer: D
Var: 1

1) You walk 55 m to the north, then turn 60° to your right and walk another 45 m. How far are you from where you originally started?
A) 87 m
B) 50 m
C) 94 m
D) 46 m
Answer: A
Var: 31

5) You walk 53 m to the north, then turn 60° to your right and walk another 45 m. Determine the direction of your displacement vector. Express your answer as an angle relative to east.
A) 63° N of E
B) 50° N of E
C) 57° N of E
D) 69° N of E
Answer: A
Var: 50+

7) The components of vector $\vec{A}$ are $A_x = + 3.90$ and $A_y = -4.00$. What is the angle measured counterclockwise from the +x-axis to vector $\vec{A}$?
A) 314°
B) 134°
C) 224°
D) 136°
E) 46.0°
Answer: A
Var: 1