

Solutions

2.1 Add the x-components: $4+1=5$.

2.2 Magnitude= $\sqrt{4^2+3^2}=5$.

2.3 Multiply corresponding components and add: $4\times 1+1\times 3=7$.

2.4 False. The order of subtraction matters: $\mathbf{BA}=-\mathbf{AB}$. Proving parallelism needs a scalar-multiple relation; a sketch alone is insufficient. Negative enlargement reverses position about its centre.

2.5 A The vector sum representing the combined displacement or force.

3.1 $\mathbf{AB}=(2, 0, 1)$, $\mathbf{AC}=(0, 3, 0)$, dot 0. Both nonzero, so angle $\pi/2$. A zero dot product involving a zero vector would not define an angle.