Quiz 1 – PH241 **Name** KEY ☐ **Pledged**

Given: $|\vec{A}| = 10.0, |\vec{B}| = 8.0$, $\theta = 27°$, and $\phi = 11°$. Let $\vec{C} = \vec{A} + \vec{B}$.

A. Find the magnitude of $\vec{C}$

B. Find the direction of $\vec{C}$ relative to north.

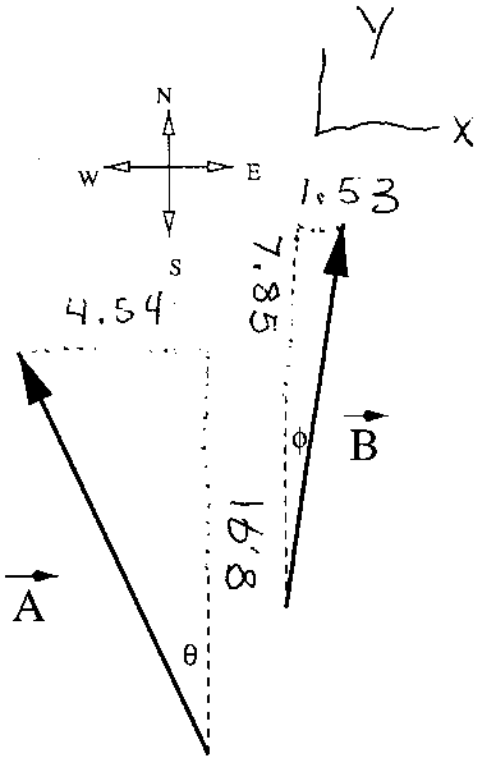
C. Write $\vec{C}$ in component form.

D. Draw $\vec{C} = \vec{A} + \vec{B}$ in graphical form.

For full credit draw a detailed picture of calculation!

For a general vector $|\vec{D}| = \sqrt{D_x^2 + D_y^2}$

and $\sin\theta_D = \frac{\text{opp.}}{\text{hyp.}}$, $\cos\theta_D = \frac{\text{adj.}}{\text{hyp.}}$, $\tan\theta_D = \frac{\text{opp.}}{\text{adj.}}$



$A_x = A\sin\theta = -4.54$ (left)

$A_y = A\cos\theta = 8.91$

$B_x = B\sin\phi = 1.53$

$B_y = B\cos\phi = 7.85$

$C_x = A_x + B_x = -3.0$

$C_y = A_y + B_y = +16.8$

(A) $|\vec{C}| = \sqrt{C_x^2 + C_y^2} = 17.0$

(B) $\theta_C = \tan^{-1}\left(\frac{|C_x|}{C_y}\right) = 10°$

(C) $\vec{C} = -3.0\,\hat{i} + 16.8\,\hat{j}$

$= (-3.0, 16.8)$

(D)