

Quiz 8

Question 1. (8 marks) Add the vectors \vec{A} and \vec{B} by using the trigonometric functions and the Pythagorean theorem given $A = 6.89$, $\theta_A = 123.0^\circ$ and $B = 29.0$, $\theta_B = 260.0^\circ$.

$$A_x = A \cos \theta_A = 6.89 \cos 123.0^\circ = -3.75$$

$$A_y = A \sin \theta_A = 6.89 \sin 123.0^\circ = 5.78$$

$$B_x = B \cos \theta_B = 29.0 \cos 260.0^\circ = -5.04$$

$$B_y = B \sin \theta_B = 29.0 \sin 260.0^\circ = -28.6$$

$$\text{LET } \vec{R} = \vec{A} + \vec{B}$$

$$\text{THUS } R_x = A_x + B_x = -3.75 + (-5.04) = -8.79$$

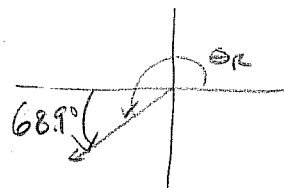
$$R_y = A_y + B_y = 5.78 + (-28.6) = -22.8$$

$$\therefore R = \sqrt{(-8.79)^2 + (-22.8)^2} = 24.4$$

$$\tan \theta_R = \frac{-22.8}{-8.82} = 2.585034014$$

$$\tan^{-1}(2.585034014) = 68.9^\circ$$

$R_x < 0, R_y < 0$
 $\Rightarrow \theta_R$ IS IN 3rd QUADRANT



$$\therefore \theta_R = 180^\circ + 68.9^\circ$$

$$= 248.9^\circ$$

$$\boxed{R = 24.4, \theta_R = 248.9^\circ}$$

Question 2. (2 marks) A triangle has side $c = 4380$ and angles $B = 34.6^\circ$ and $A = 37.4^\circ$. Draw the triangle and find side b .

$$C = 180^\circ - 34.6^\circ - 37.4^\circ = 108.0^\circ$$

$$\frac{c}{\sin C} = \frac{b}{\sin B}$$

$$\Rightarrow b = \frac{c \sin B}{\sin C} = \frac{4380 \sin 34.6^\circ}{\sin(108.0^\circ)} =$$

$$= 2620$$

