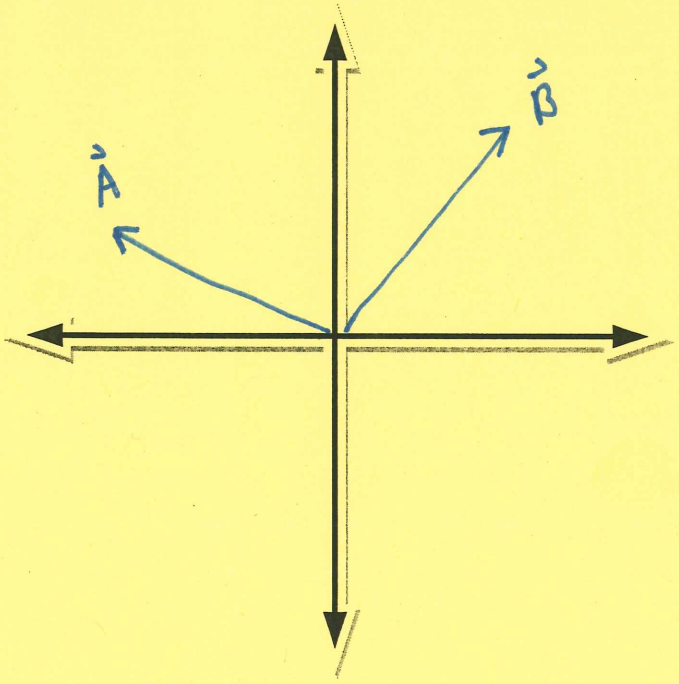
PHYS 2211
Principles of Physics I
Quiz 1

Name Charles Johnson

Show all work in the spaces provided.

1) Given two vectors $\vec{A} = -8\hat{i} + 2\hat{j}$ and $|\vec{B}| = 15, \theta = 46°$



a) Using the coordinate system above draw the vectors.(4 pts)

$B_x = |\vec{B}| \cos(46°)$
$B_x = (15) \cos(46°)$
$B_x = 10.42$
$B_y = |\vec{B}| \sin(46°)$
$B_y = (15) \sin(46°)$
$B_y = 10.79$

$A_x = -8$
$A_y = 2$

b) What is the sum of the two vectors in terms of a magnitude and direction? (6 pts)

$\vec{R} = \vec{A} + \vec{B}$
$R_x = A_x + B_x$
$R_x = -8 + 10.42 = 2.42$

$R_y = A_y + B_y$
$R_y = 2 + 10.79 = 12.79$

$|\vec{R}| = \sqrt{R_x^2 + R_y^2}$
$|\vec{R}| = \sqrt{(2.42)^2 + (12.79)^2}$
$|\vec{R}| = 13$

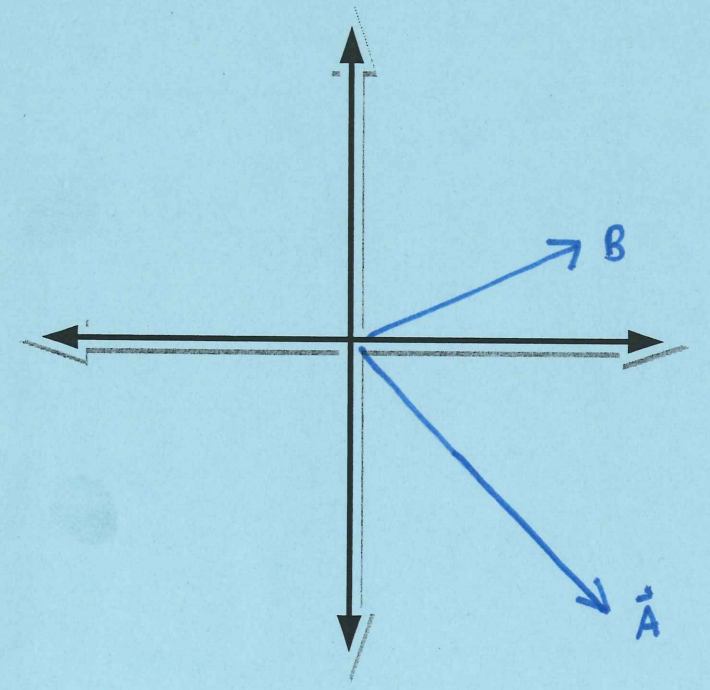
$\theta = \tan^{-1}\left(\frac{R_y}{R_x}\right)$
$\theta = \tan^{-1}\left(\frac{12.79}{2.42}\right)$
$\theta = 79°$ above (+) x-axis!

PHYS 1111
Introductory Physics I
Quiz 1

Name Charles Jahson

Show all work in the spaces provided.

1) Given two vectors $\vec{A} = (5, -7)$ and $|\vec{B}| = 25, \theta = 30°$



a) Using the coordinate system above draw the vectors.(4 pts)

$B_x = |\vec{B}| \cos\theta$
$B_x = (25)\cos(30°)$
$B_x = 21.63$

$B_y = |\vec{B}| \sin\theta$
$B_y = (25)\sin(300)$
$B_y = 12.5$

$A_x = 5$
$A_y = -7$

b) What is the sum of the two vectors in terms of a magnitude and direction? (6 pts)

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

$R_x = A_x + B_x$
$R_x = 5 + 21.63$
$R_x = 26.63$

$R_y = A_y + B_y$
$R_y = -7 + 12.5$
$R_y = 5.5$

$|\vec{R}| = \sqrt{R_x^2 + R_y^2}$
$|\vec{R}| = \sqrt{(26.63)^2 + (5.5)^2}$
$|\vec{R}| = 27.19$

$\theta = \tan^{-1}\left(\frac{R_y}{R_x}\right)$
$\theta = \tan^{-1}\left(\frac{5.5}{26.63}\right)$
$\theta = 11.67°$ above (+) x-axis!