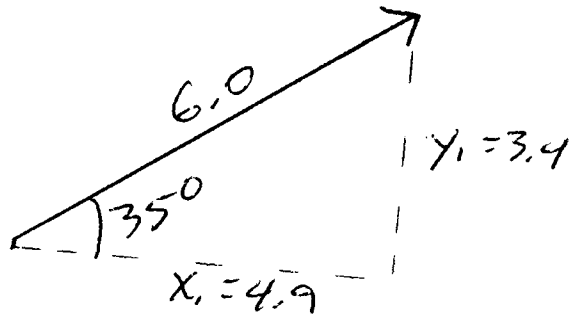


Phet Vectors Simulation Lab

Scale 1cm = 1 unit

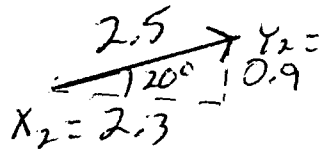
#1 Part 3
Vector 1



$$x_1 = 6.0 \cos 35^\circ = \boxed{4.9}$$

$$y_1 = 6.0 \sin 35^\circ = \boxed{3.4}$$

Vector 2



$$x_2 = 2.5 \cos 70^\circ = \boxed{2.3}$$

$$y_2 = 2.5 \sin 70^\circ = \boxed{0.9}$$

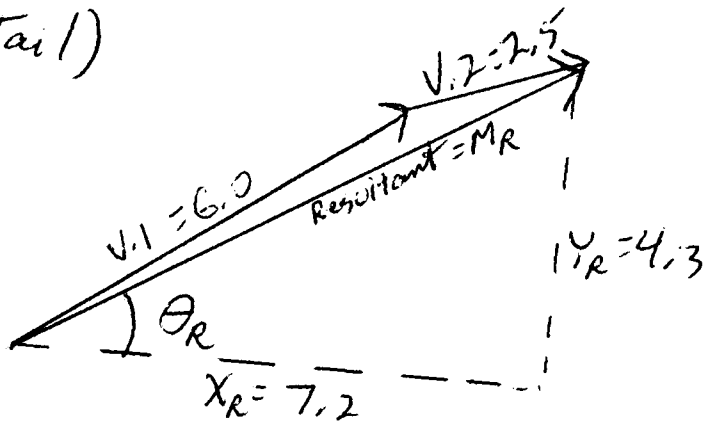
Resultant (Tip to Tail)

$$\begin{array}{l} \Sigma X \\ \Sigma Y \end{array}$$

$$x_1 = 4.9 \quad y_1 = 3.4$$

$$x_2 = 2.3 \quad y_2 = 0.9$$

$$\boxed{7.2 = x_R} \quad \boxed{4.3 = y_R}$$



$$M_R = \sqrt{(7.2)^2 + (4.3)^2} = \sqrt{51.8 + 18.5} = \sqrt{70.3}$$

$$\theta_R = \frac{\text{opp}}{\text{adj}} \therefore \theta_R = \tan^{-1}\left(\frac{\text{opp}}{\text{adj}}\right) = \tan^{-1}\left(\frac{4.3}{7.2}\right) = \boxed{30.8^\circ}$$

$$\boxed{M_R = 8.4}$$

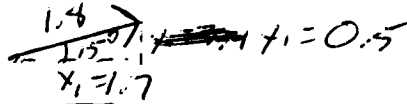
Phet Vectors Simulation Lab

Part 3
2

scale 1cm = 1 unit

2

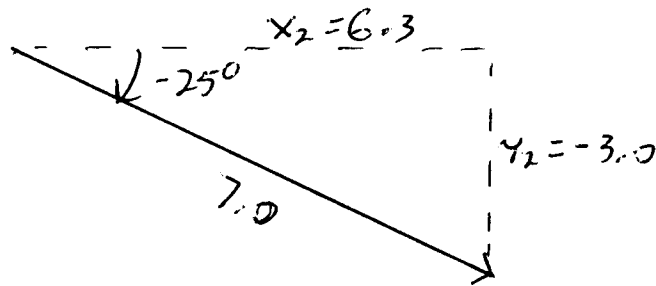
Vector 1



$$x_1 = 1.4 \cos 15^\circ = \boxed{1.7}$$

$$y_1 = 1.4 \sin 15^\circ = \boxed{0.5}$$

Vector 2



$$x_2 = 7.0 \cos -25^\circ = \boxed{6.3}$$

$$y_2 = 7.0 \sin -25^\circ = \boxed{-3.0}$$

Resultant (Tip to Tail)

$$\frac{\sum X}{x_1 = 1.7}$$

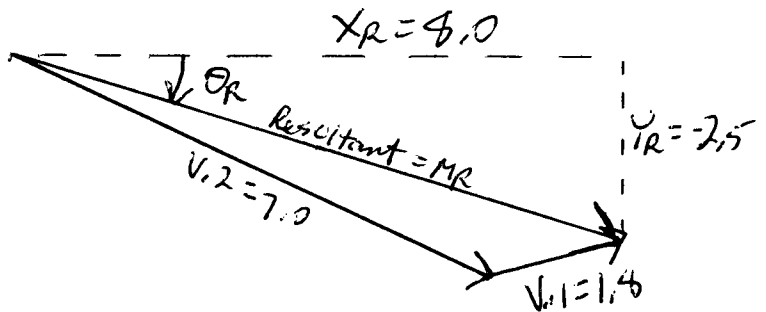
$$\frac{\sum Y}{y_1 = 0.5}$$

$$x_2 = 6.3$$

$$y_2 = -3.0$$

$$\boxed{x_R = 8.0}$$

$$\boxed{y_R = -2.5}$$



$$MR = \sqrt{(8.0)^2 + (-2.5)^2} = \sqrt{64 + 6.25} = \sqrt{70.25} = \boxed{8.4 = MR}$$

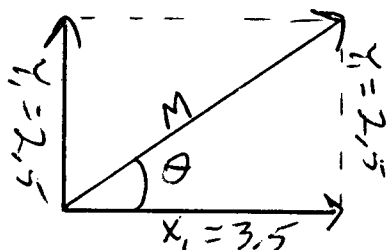
$$\theta_R = \tan^{-1}\left(\frac{\text{opp}}{\text{adj}}\right) = \tan^{-1}\left(\frac{-2.5}{8.0}\right) = \boxed{-17.4^\circ}$$

Phet Vectors Simulation Lab

3

Scale 1cm = 1 unit

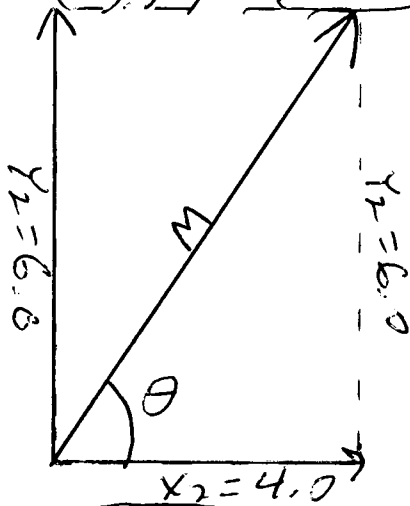
Part 3
#3
Vector 1



$$M = \sqrt{(3.5)^2 + (2.5)^2} = \sqrt{18.5} = 4.3$$

$$\theta = \tan^{-1}\left(\frac{2.5}{3.5}\right) = 35.5^\circ$$

Vector 2

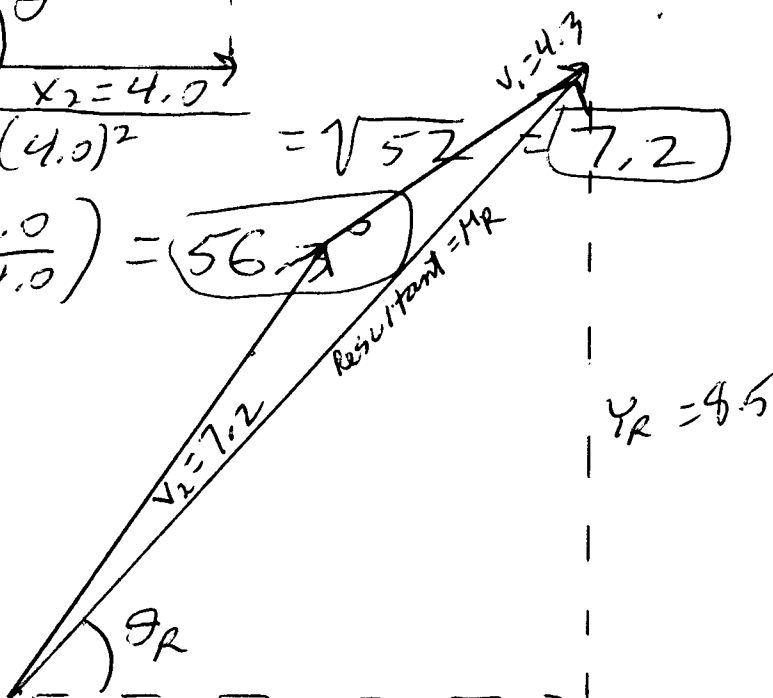


$$M = \sqrt{(6.0)^2 + (4.0)^2} = \sqrt{52} = 7.2$$

$$\theta = \tan^{-1}\left(\frac{6.0}{4.0}\right) = 56.3^\circ$$

Resultant

ΣX	ΣY
$x_1 = 3.5$	$y_1 = 2.5$
$x_2 = 4.0$	$y_2 = 6.0$
$\underline{+}$	$\underline{+}$
$x_R = 7.5$	$y_R = 8.5$



$$MR = \sqrt{7.5^2 + 8.5^2} = \sqrt{128.5} = 11.3$$

$$\theta_R = \tan^{-1}\left(\frac{8.5}{7.5}\right) = 48.6^\circ$$

Phet Vectors Simulation Lab.

(4)

Scale 1 cm = 1 unit

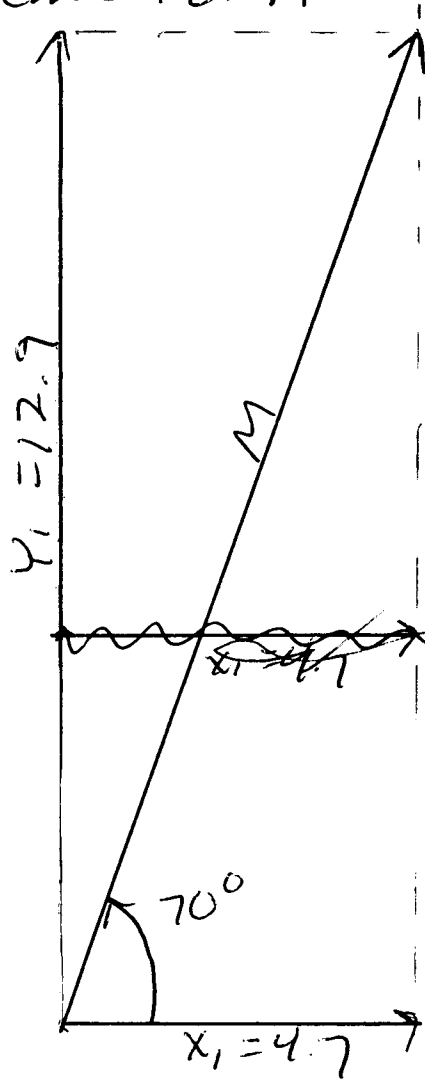
Part 3
#4
Vector 1

$$\tan 70^\circ = \frac{y}{x}$$

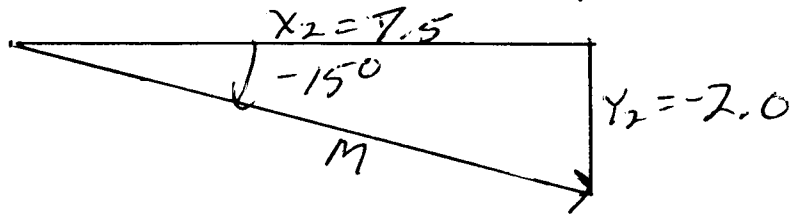
$$x = 4.7 \tan 70^\circ$$

$$x_1 = 12.9 \rightarrow$$

$$M = \sqrt{4.7^2 + 12.9^2} = 13.7$$



Vector 2



$$\tan -15^\circ = \frac{y}{x}$$

$$\tan -15^\circ = \frac{-2.0}{x_2}$$

~~$$x_2 = \frac{-2.0 \tan 15^\circ}{1}$$~~

$$x = 0.5$$

$$x_2 = \frac{-2.0}{\tan(-15^\circ)} = 7.5$$

$$M = \sqrt{(7.5)^2 + (-2.0)^2}$$

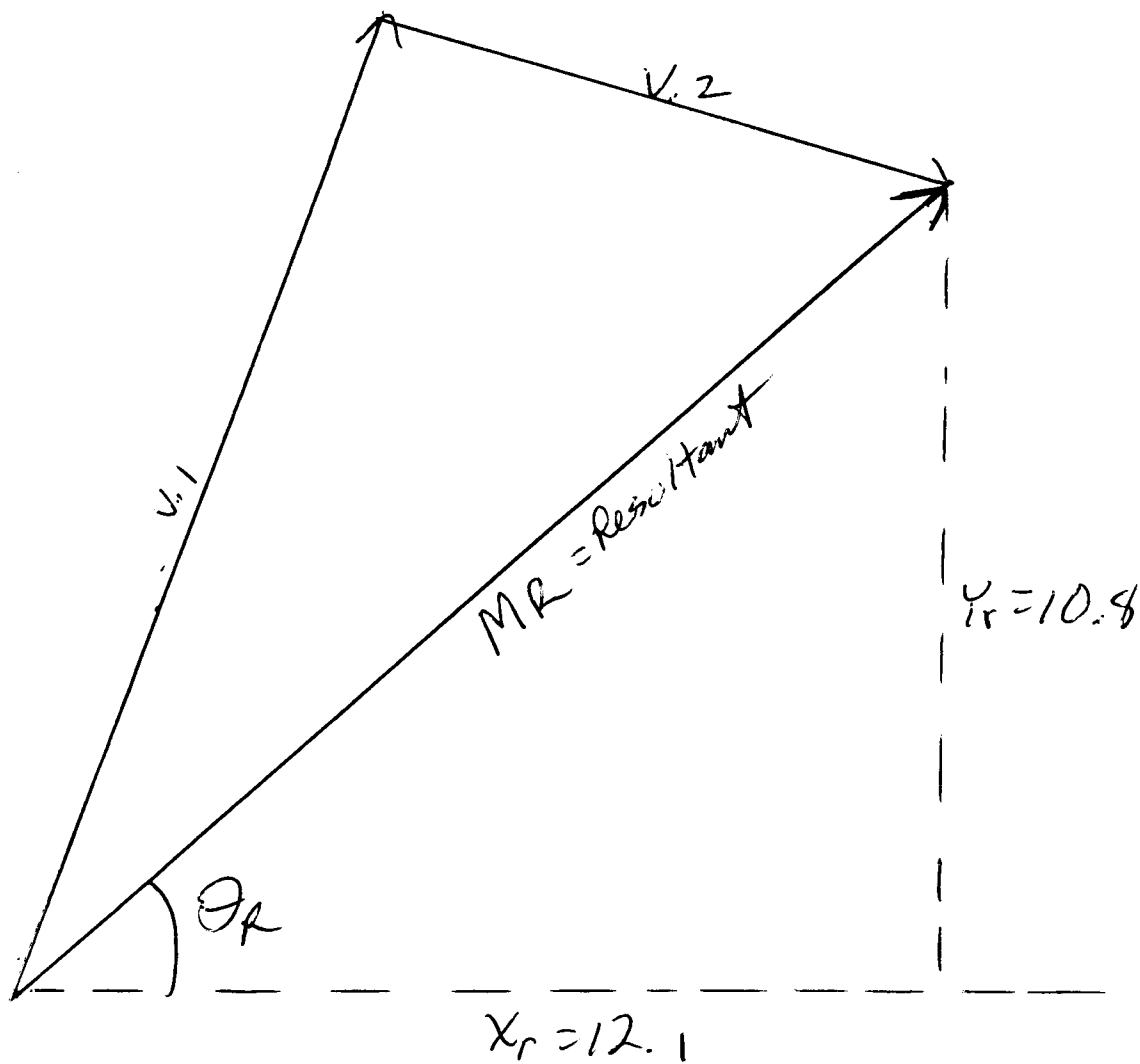
$$M = 7.8$$

Phet Vectors Simulation Lab
Scale 1cm = 1 unit

(5)

Part 3
#4

Resultant (Tip to Tail)



$$M_R = \sqrt{(12.1)^2 + (10.8)^2} = \boxed{16.2}$$

$$\theta_R = \tan^{-1}\left(\frac{10.8}{12.1}\right) = \boxed{41.8^\circ}$$