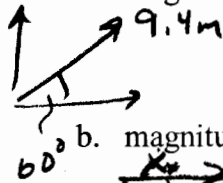


Vectors:

1. Find the x and y components for:
 a. magnitude 9.4 m, angle 60°



$$\sin 60 = \frac{V_y}{9.4 \text{ m}}$$

$$V_y = 8.14 \text{ m}$$

$$\cos 60 = \frac{V_x}{9.4 \text{ m}}$$

$$V_x = 4.7 \text{ m}$$

- b. magnitude 15 km, angle 315°



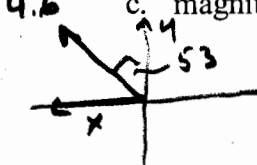
$$\sin 45 = \frac{y}{15 \text{ km}}$$

$$y = 1.06 \times 10^1 \text{ km}$$

$$\cos 45 = \frac{x}{15 \text{ km}}$$

$$x = 1.06 \times 10^1 \text{ km}$$

- c. magnitude 4.6 cm, angle 143°



$$\sin 53 = \frac{y}{4.6 \text{ cm}}$$

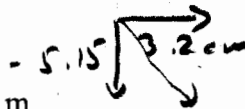
$$y = -3.67 \text{ cm}$$

$$\cos 53 = \frac{x}{4.6 \text{ cm}}$$

$$x = 2.77 \text{ cm}$$

2. Find the magnitude and direction of the vector represented by each of the following pairs:

- a. $A_x = 3.2 \text{ cm}$ $A_y = -5.15 \text{ cm}$

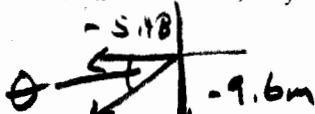


$$\tan \theta = \frac{5.15}{3.2}$$

$$\theta = 328.14$$

$$\theta = 58.14 + 360$$

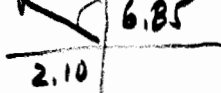
- b. $A_x = -5.48 \text{ m}$ $A_y = -9.6 \text{ m}$



$$\tan \theta = \frac{-9.6}{-5.48}$$

$$\theta = 240.28$$

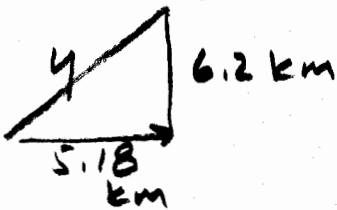
- c. $A_x = -2.10 \text{ km}$ $A_y = 6.85$



$$\tan \theta = \frac{6.85}{2.10}$$

$$\theta = 107.04$$

3. A disoriented physics teacher drives 5.18 km east, then 6.2 km north, find the resultant displacement (magnitude and direction).

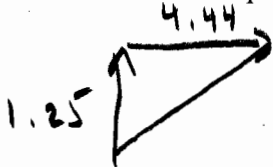


$$a^2 + b^2 = c^2$$

$$(5.18)^2 + (6.2)^2 = c^2$$

$$c = 8.08 \text{ km}$$

4. A postal employee drives a delivery truck 1.25 mi north, then 4.44 mi east, find the resultant displacement.



$$a^2 + b^2 = c^2$$

$$(1.25)^2 + (4.44)^2 = c^2$$

$$c = 4.61 \text{ mi}$$