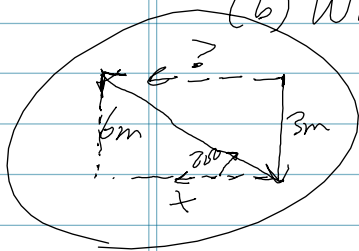


Vector Problems

- 1) An object travels south for 3m and then 6m at 20° N of W. (a) What distance did the object travel? (b) What is the object's change in position?



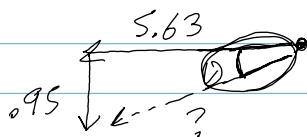
	X	Y
3	0	-3
6	$\cos 20^\circ = \frac{x}{6}$ $x = -5.63$	$\sin 20^\circ = \frac{y}{6}$ $y = +2.05$
Total	-5.63	-0.95

$$0.95^2 + 5.63^2 = C^2$$

$$C = 5.71m$$

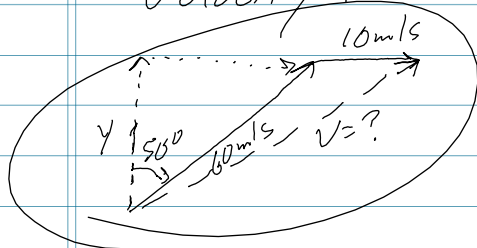
$$\uparrow$$

$$3+6 = 9m$$

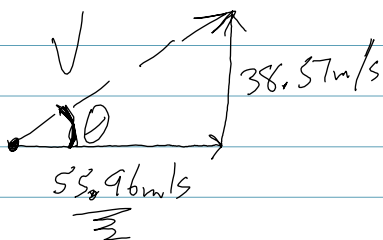


$$\tan^{-1}\left(\frac{0.95}{5.63}\right) = \theta = 9.58^\circ \text{ S of W}$$

- 2) A plane flies at 60m/s at 50° E of N & a wind blows at 10m/s east. What is the plane's actual velocity?



	X	Y
60m/s	$\sin 50^\circ = \frac{V_x}{60}$ $V_x = +45.96m/s$	$\cos 50^\circ = \frac{V_y}{60}$ $V_y = +38.57m/s$
10m/s	+10m/s	0
Total	+55.96m/s	+38.57m/s



$$38.57^2 + 55.96^2 = C^2$$

$$C = 67.96m/s$$

$$\tan^{-1}\left(\frac{38.57}{55.96}\right) = \theta$$

$$\theta = 34.58^\circ \text{ N of E}$$