

## Very Vicious Vectors

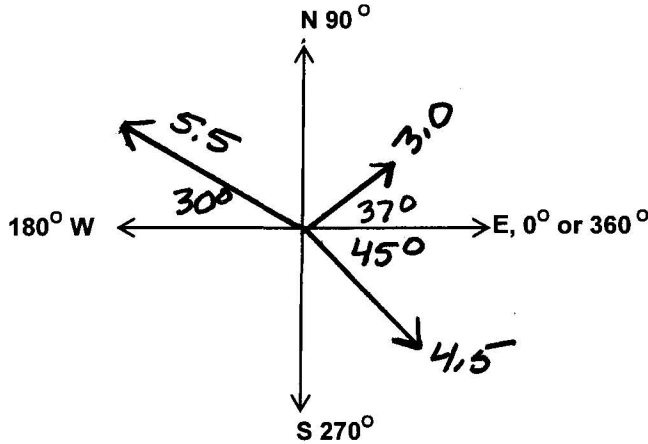
Find the components of these vectors...

1) 3 N @ 37°

2) 4.5 N @ 315°

3) 5.5 N @ 150°

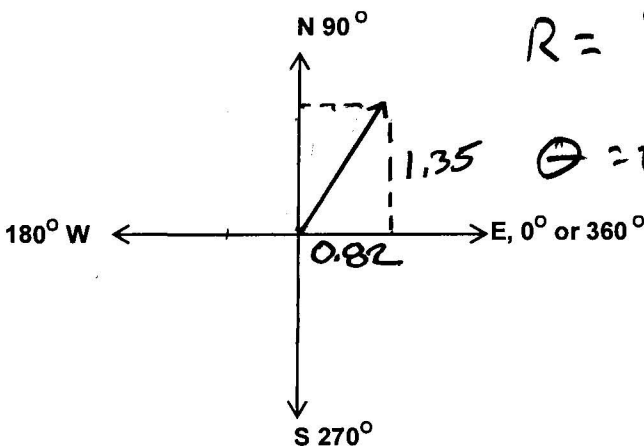
Draw and label each of the vectors on the coordinate system below. ( use an appropriate scale)



Find the X and Y perpendicular components of the vectors and complete the chard below. Show all your work?

Vector	X calculation	X component	Y calculation	Y component
1	$3.0 \cos 37$	2.40	$3.0 \sin (37)$	1.8
2	$4.5 \cos 45$	3.18	$-4.5 \sin (45)$	-3.2
3	$-5.5 \cos 30$	-4.76	$5.5 \sin (30)$	2.75
	Total	0.82	Total	1.35

Make a drawing and compute your resultant vector from the components.



$$R = \sqrt{0.82^2 + 1.35^2} = 1.58 \text{ N}$$

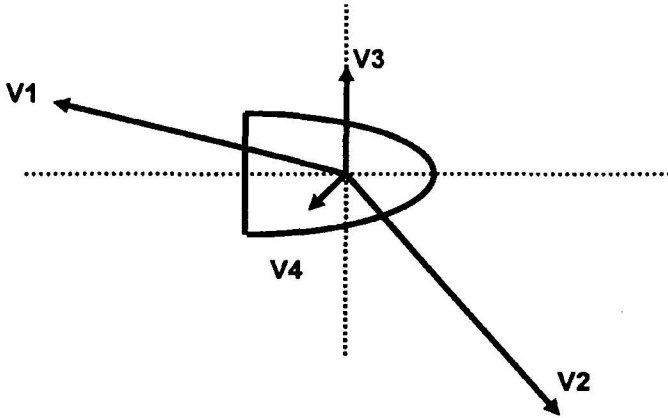
$$\Theta = \tan^{-1}\left(\frac{1.35}{0.82}\right) = 59^\circ \text{ N of E}$$

# "A Three Hour Tour"

Name \_\_\_\_\_ Period \_\_\_\_\_

Gilligan, the Skipper, Ginger and Mr. Howell all decided to sneak off of the deserted island in a secret boat they had built. If each of the four pushes giving the boat the velocities listed below, what is the net velocity of the boat? (you may find it easier if you convert to polar coordinates first)

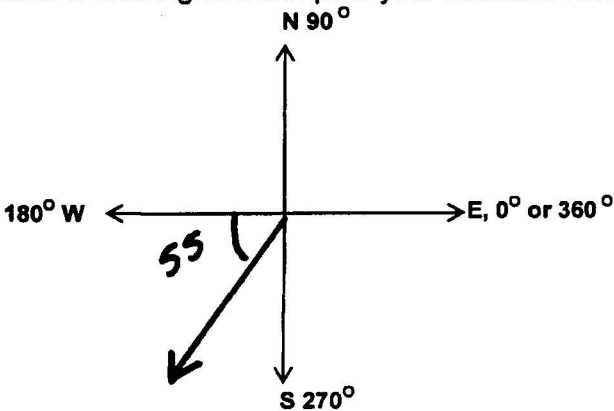
- Vector 1: Gilligan: 8.5 m/s @ 20° N of W
- Vector 2: Skipper: 11.0 m/s @ 55° S of E
- Vector 3: Ginger: 3.6 m/s due North
- Vector 4: Mr. Howell: 1.6 m/s @ 52° S of W



Fill out your beloved chart!!!

Vector	X calculation	X component	Y calculation	Y component
V <sub>1</sub>	$-8.5 \cos(20)$	-7.99	$8.5 \sin(20)$	2.91
V <sub>2</sub>	$11.0 \cos(55)$	6.31	$-11 \sin(55)$	-9.01
V <sub>3</sub>		0		3.6
V <sub>4</sub>	$-1.6 \cos(52)$	-0.99	$-1.6 \sin(52)$	-1.26
	Total	-2.67	Total	-3.76

Make a drawing and compute your resultant vector from the components.



$$V = \sqrt{2.67^2 + 3.76^2}$$

$$= 4.61 \text{ m/s}$$

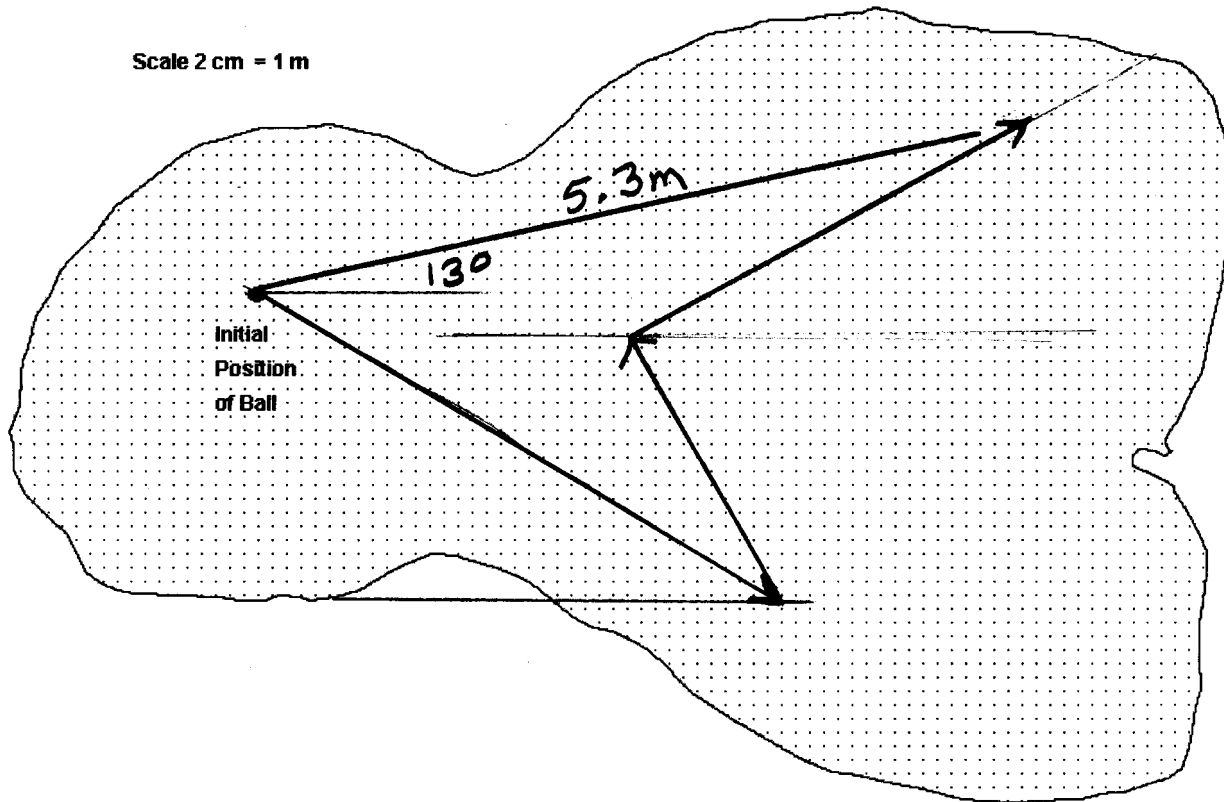
$$\theta = \tan^{-1} \left( \frac{3.76}{2.67} \right)$$

$$\theta = 55^\circ \text{ South of WEST}$$

## FORE!

A golfer takes three strokes to get his ball into the hole. The first stroke displaces the ball 4 m @ 30° S of E; the second displaces the ball 2 m @ 60° N of W; the third stroke displaces the ball 3 m @ 28° N of E and puts ball in the hole.

1. Draw the shots to determine where the hole is graphically and draw your resultant displacement vector and determine its magnitude and direction.



2. Use the chart below to calculate the resultant displacement, in other words where should the golfer have aimed to one put the green.

Vector	X calculation	X component	Y calculation	Y component
1	$4 \cos(30)$	3.46	$-4 \sin(30)$	-2.0
2	$-2 \cos(60)$	-1.00	$2 \sin(60)$	1.73
3	$3 \cos(28)$	2.65	$3 \sin(28)$	1.41
	Total	5.11	Total	1.14

Compute your resultant vector from the components (make a drawing):

$$d = \sqrt{5.11^2 + 1.14^2} = 5.23 \text{ m}$$

$$\text{@ } 12.6^\circ \text{ N of E}$$