Mr. Alexander   Name: _____
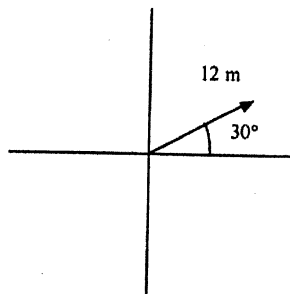
Physics: Vector Addition Worksheet I   Date: _____ Period: _____
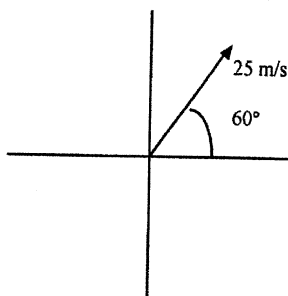
Part I:

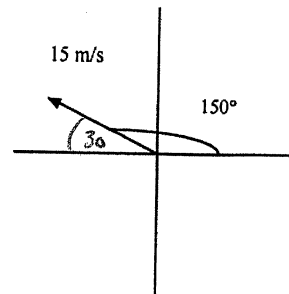**Find the x and y components of each of the following vectors.**

12 m 30°

25 m/s 60°

15 m/s 150° 30

$x = \underline{12 \cos 30 = 10.39}$

$y = \underline{12 \sin 30 = 6}$

$x = \underline{25 \cos 60 = 12.5}$

$y = \underline{25 \sin 60 = 21.65}$

$x = \underline{-15 \cos 30 = -13.0}$

$y = \underline{15 \sin 30 = 7.5}$

Add the following vectors.

12 m/s 20°

12 m/s 70°

21.75 m/s 45° 15.38 15.38
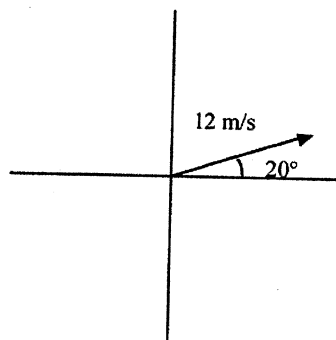
$x_1 = \underline{12 \cos 20 = 11.28}$ +

$y_1 = \underline{12 \sin 20 = 4.1}$ +
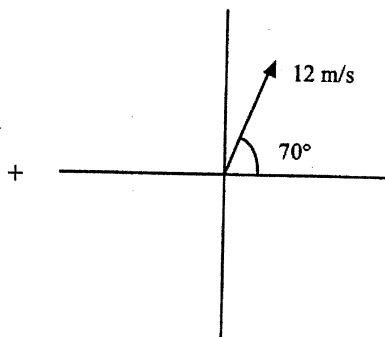
$x_2 = \underline{12 \cos 70 = 4.1}$ =

$y_2 = \underline{12 \sin 70 = 11.28}$ =

$x_{tot} = \underline{15.38}$

$y_{tot} = \underline{15.38}$

50 m 135° 45

90° 30 m

35.76 5.36 8° 35.36
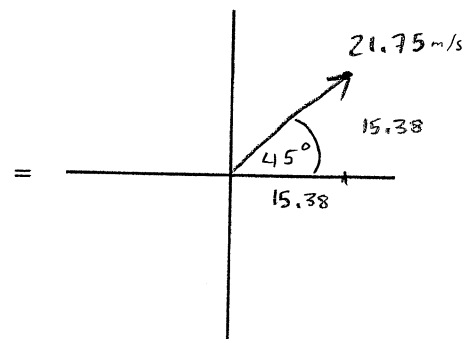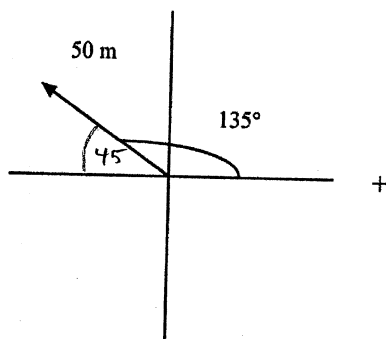
$x_1 = \underline{-50 \cos 45 = -35.36}$ +

$y_1 = \underline{50 \sin 45 = 35.36}$ +
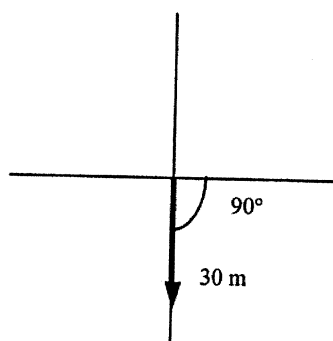
$x_2 = \underline{0}$

$y_2 = \underline{-30}$

=

=
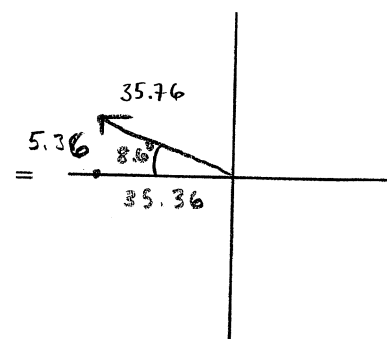
$x_{tot} = \underline{-35.36}$

$y_{tot} = \underline{5.36}$

Add the following vectors and draw the resultant.

X: $-27\cos 30 = -23.4 +$ | $17\cos 20 = 16.0$

y: $27\sin 30 = 13.5 +$ | $17\sin 20 = 5.8$

19.3

7.4

20.7 m
$\theta = 69° \; N \; of \; W$

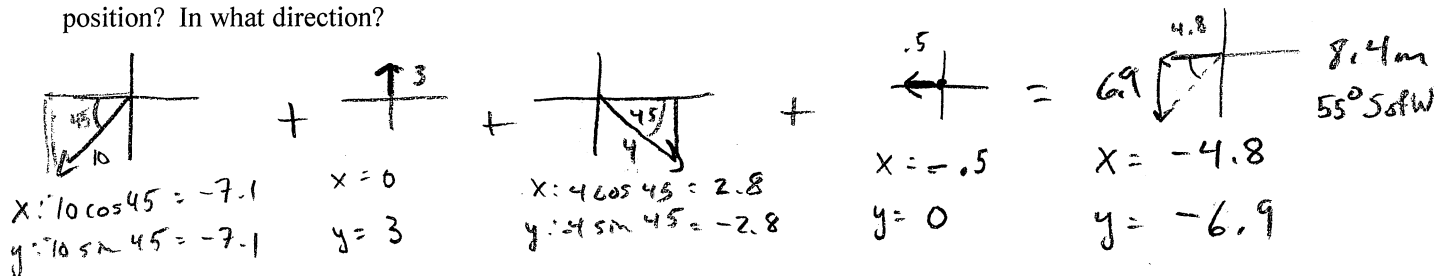$\tan\theta = \dfrac{19.3}{7.4}$

X = -7.4
y = 19.3
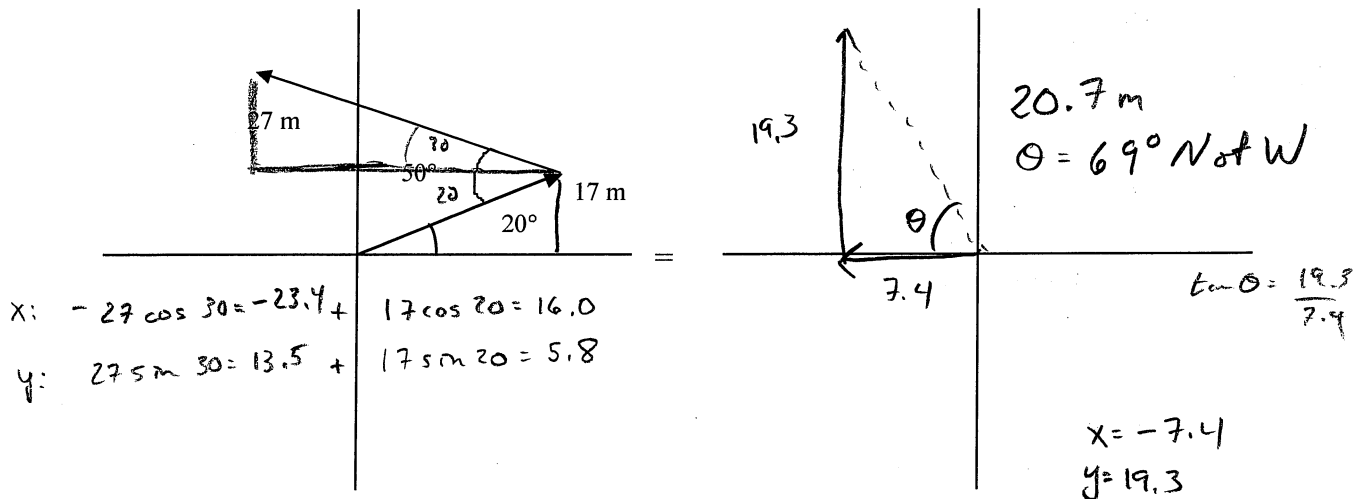
For each of the following questions, draw a picture representing what is happening and then answer the question. Be sure that your picture and your answer show the same thing.

1. You travel 25 meters east and then travel 48 meters south. What is your total displacement?

X = -25   X = 0   X = -25   54.1 m
y = 0   y = -48   y = -48   62.5° S of W
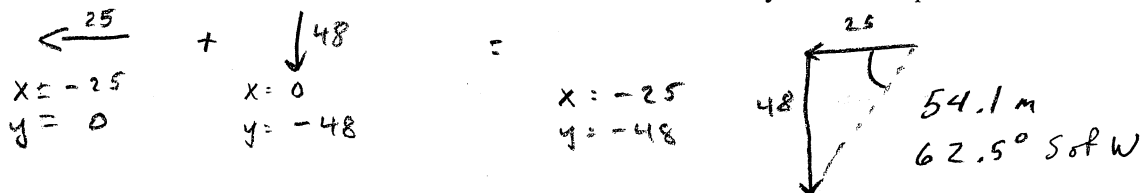
2. During his first golf tournament (at age 2), Tiger Woods actually had to four-putt one of the holes (meaning he had to putt the ball four times before it went in!). His putts were as follows: 10 meters southwest, 3 meters north, 4 meters southeast, and 0.5 meters west. How far was the hole from his original putting position? In what direction?

X: $10\cos 45 = -7.1$ X = 0   X: $4\cos 45 = 2.8$ X = -.5   X = -4.8   8.4 m
y: $10\sin 45 = -7.1$ y = 3   y: $4\sin 45 = -2.8$ y = 0   y = -6.9   55° S of W

3. The designated course for a 6 kilometer road race has the runners going 4.5 km west and then 1.5 km north, where the finish line is located. A less-than-honest contestant in the race runs 2.5 km west and then decides to head straight toward the finish line. What distance does this wanna-be actually cover during his race?

$2.5 + 2.5 = 5.0 \; km$