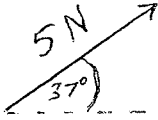# Pre-Physics Worksheet #5: Vectors

COMPONENT DECOMPOSITION:

Given magnitude and direction, find the x- and y-components of each vector.
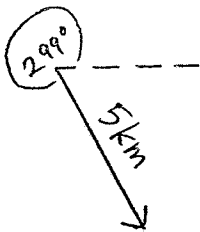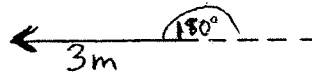
1)

5 N   37°

2)

40 m/s   60°

3)

299°   5 km

4)

180°   3m

5)

10 m/s   115°

6)

235°   18 N

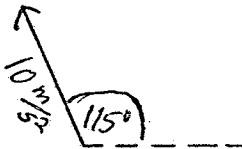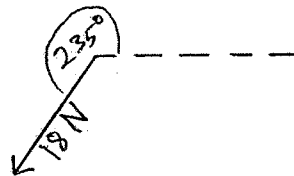## FINDING MAGNITUDE AND DIRECTION:

Given x- and y-components, find the magnitude and direction of each vector.
Write angles as measured in degrees from the positive x-axis.

7) < 3 , 6 >

8) < 5 , -3 >

9) < -2 , 10 >

10) < -1 , -4 >

11) < 0 , 8 >

12) < 11 , 11 >

VECTOR ARITHMETIC:

Given the vectors $\vec{u}=\langle 3,5\rangle$, $\vec{v}=\langle -2,8\rangle$, and $\vec{w}=\langle 4,-1\rangle$, evaluate...

13) $\vec{u}+\vec{v}=$

14) $\vec{u}-\vec{v}=$

15) $2\vec{v}+3\vec{w}=$

16) $3\vec{u}+\vec{v}-4\vec{w}=$

17) Find scalar multipliers to fill in the blanks in this equation: $\underline{\quad}\vec{u}+\underline{\quad}\vec{v}=\vec{w}$

18) List three quantities in physics that are vectors. Why are they vectors?

19) List three quantities in physics that are scalars. Why aren't they vectors?

20) Suppose two forces are already acting on an object: a 30 N force to the south and a 50 N force to the northwest. If you want the object to remain perfectly still, what single force (magnitude and direction!) will you need to apply in order to completely cancel out the others? A diagram maybe helpful here.