Name _____ # _____ Date _____

Section _____ St. Mary's H.S. Physics

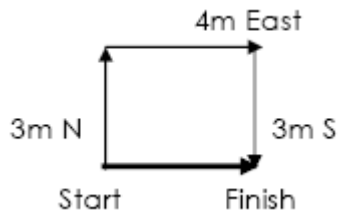
Geometry and Trigonometry for Regents Lab Worksheet

(Maximum Score = 44 points)

I. Vector - quantity with magnitude (size) and direction Ex) 5 meters East, 4m/s West, 5 Newtons South

Displacement - Distance and direction from Start to Finish

Ex 1)



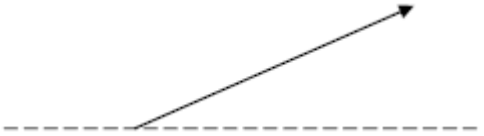
What's the distance?_____What's the displacement _____

Ex 2) A man walks 4 meters east then 4 meters south.

1) Draw and LABEL the vector diagram (1 cm = 1 meter) showing the man's walk and label the displacem vector (1 point).

2) What is the man's displacement? _____ (1 point)

A. Velocity Components



V = 40 m/s

1) Carefully draw and label the horizontal and vertical components of this velocity vector (2 points).

2) Measure the angle between the horizontal and the vector _____ (1 point)

3) What formula on the reference table would you use to find the horizontal component of the vector?

a) Find the **horizontal component** _____(2 points)

b) Find the **vertical component** of the vector_____ (2 points)

B. Force Vectors

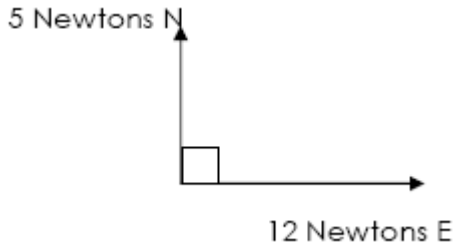
1) Find the magnitude and direction of the resultant of the vectors below _____ (1 point)
LABEL the resultant.

2) Carefully sketch the resultant into the drawing below (1 point)

3) What is the magnitude and direction of the equilibrant? _____ (1 point)

4) Carefully sketch the equilibrant into the picture below. (1 point)

NOTE – Not drawn to scale

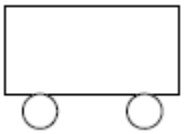


5) Draw the resultant of the following pairs of vectors. (2 points)

(Note: Vectors are drawn head to tail)

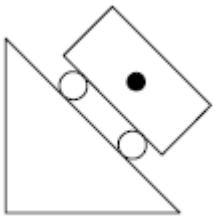
(Note: Vectors are drawn tail to tail)

6) Draw the force vector 50 Newtons 30 degrees North of East on to the cart below (from the middle of the car) (2 points) **Scale 1 cm = 10 Newtons**



Free Body Diagrams - Diagram that shows all the forces acting on a body

1) A cart is moving down a ramp. Carefully draw the weight force, friction force and normal force on the c (3 points)



II. Light

A. Reflection

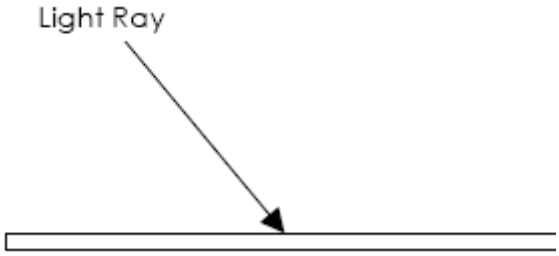
In the drawing below:

1) Draw and label the normal with a dotted line (1)

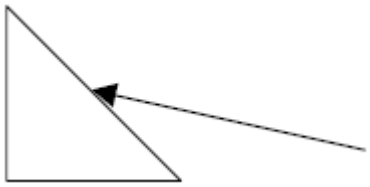
2) Measure and label the angle of incidence (2)

3) Draw in the reflected ray (1 point)

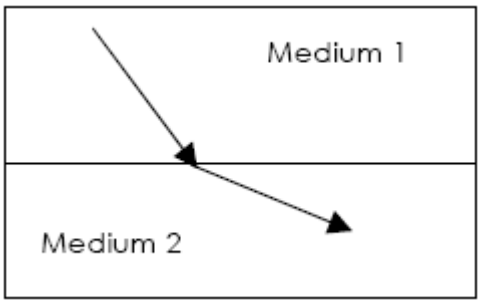
4) How big is the angle of reflection? _____ (1)



5) Draw the angle of reflection into the diagram on the right.
(1 point)



B) Refraction - the bending of light caused when light changes media



1) Draw the normal into the diagram above. (use a dotted line) (1 point)

2) What is the angle of incidence? _____ (1 point)

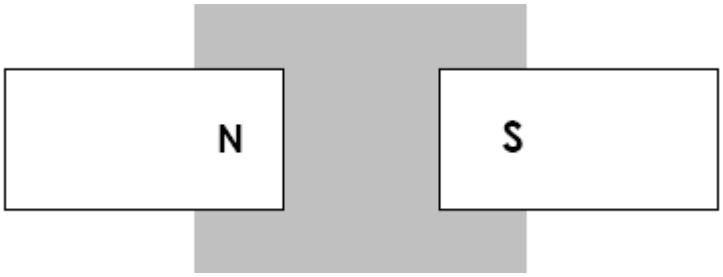
3) What is the angle of refraction? _____ (1 point)

4) Label the angle of incidence in the diagram above with the symbol θ in (1 point)

5) Label the angle of refraction in the diagram above with the symbol θ ref (1 point)

Magnetism

1) In the gray region, draw the flux lines created by these two magnets (1 point)

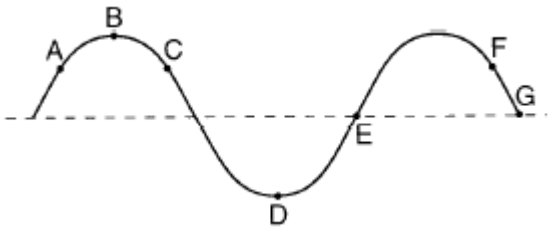


2) Draw the flux lines ON and AROUND the bar magnet below. (1 point)

III. Waves

1) Measure the following properties of the wave below. (report your measurements with the correct significant digits that show the accuracy of your measuring device)

a) wavelength _____ (1 point) b) amplitude _____(1 point)



2) If the frequency of this wave is 10 Hz, what is the speed of the wave? (3 points)

3) Draw a second wave on the picture above that has the same amplitude but twice the frequency of the original. (1 point)