Name: _____ Phys 12

2.1 Describing Vectors: Horizontal and Vertical Components

Review: What's the difference between a vector and a scalar?

Most of grade 11 we've dealt with motion in 1D. In grade 12, we will be analyzing motion in 2D. Before looking at breaking down 2D vectors, let's take a look at how we name them.

The name of your vector begins with the _____ then _____.

Remember, vectors can point North, South, East, West AND up/down. Think of yourself playing a 3D video game.

When describing up/down vectors, the language looks like:

_____ at _____ _____ the horizontal.
(magnitude) (angle) (above/below)

Ex. 1. 44m/s 45° above the horizontal

When dealing with North, South, East, and West, the language becomes more complicated…

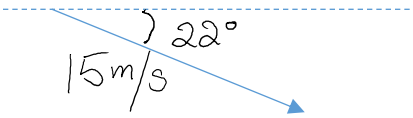
_____ at _____ _____ of _____
(magnitude) (angle) (second arrow) (first arrow)

Ex. 2. 1500km 33° North of East

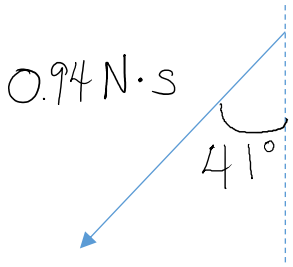
Ex. 3. 420N 68° South of West

Name the following vectors:

Ex. 4.



Ex. 5.



Inquiry Question: Is there another way of describing the vectors you used above? How? Why does it work?

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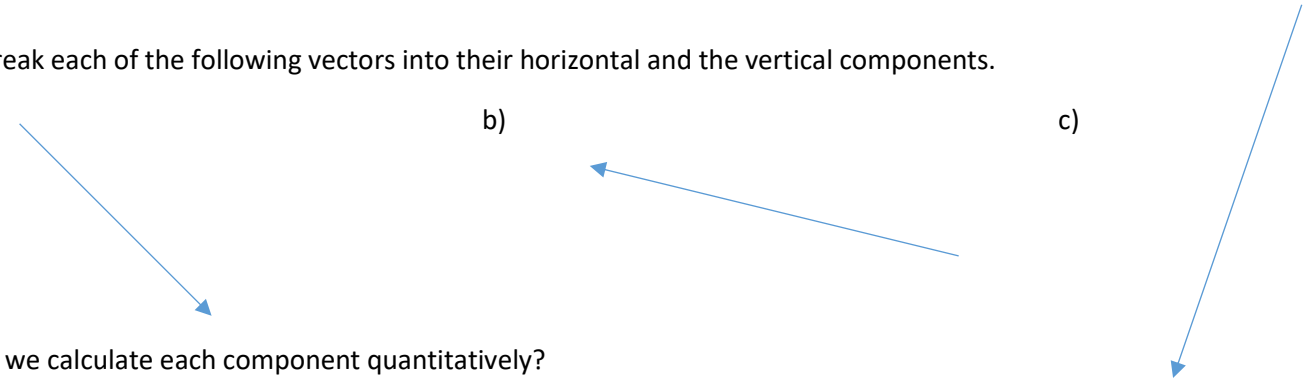
With 2D motion, we need to deal with 2 axes, namely the **horizontal** and the **vertical** axis. It is difficult to analyze motion in 2D in a linear fashion, so we need to break our 2D motion into **2 components**, the **horizontal (x)** and the **vertical (y)** direction.

Ex. 6. Break each of the following vectors into their horizontal and the vertical components.

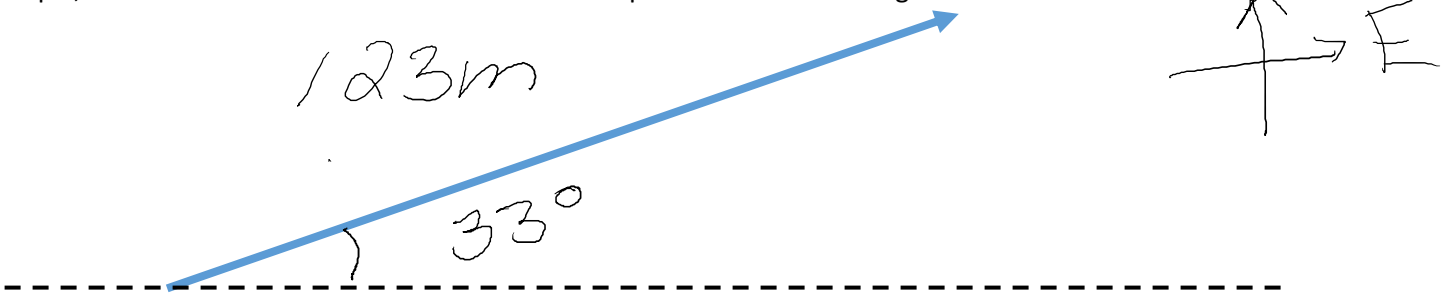
a) b) c)



How do we calculate each component quantitatively?

We will use _____ and _____ to calculate the components.

For example, let's calculate the horizontal and vertical component of the following:



Calculate the horizontal and vertical components of the following:

Ex. 7. 770m 88° South of East

Ex. 8. 1.2m/s^2 12° North of West

Ex. 9. 120m/s 55° below the horizontal