Physics 11

**Section 3.2: Vectors and Formulas?!**

A quick SOH CAH TOA warm-up. Solve the triangles below for $x$ and $θ$.

50o

$$x$$

12 cm

$$θ$$

3 m/s2

2 m/s2

So far, we’ve been plugging vectors into formulas by representing them as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which

can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

In 2D, things get more complicated. For example, how would you write the following vector as a number?

32 m/s [10o north of west]

So, in 2D, rather than plugging numbers into our equations, we’ll have to plug in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Example:** After accelerating at 4 m/s2 south for 3 seconds, a hovercraft full of eels ends up traveling at 30 m/s east. What velocity did it start with?

**Example:** A cannonball is fired horizontally off a cliff at 10 m/s. If it hits the ground 5 s later, what is its displacement?