Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Physics 11

**Worksheet 3.2**

**Vectors and Formulas?!**

1. A cat is fired horizontally off a cliff at 30 km/h. If it lands on the ground 2.5 seconds later (on its feet, of course), what speed is it traveling when it first contacts the ground?

1. A hovercraft traveling 90 km/h south accelerates at 11 m/s2 east for 3 seconds. What is its displacement during this period of time?
2. A reckless student is rolling down the hallway on a wheeled chair while holding a fire extinguisher. Mr. Q is patrolling the halls and spots the student just as he fires the extinguisher for 1.5 seconds, causing an acceleration of 3 m/s2 west. Mr. Q determines his final velocity to be 6 m/s north and promptly hands him a speeding ticket (the hallway speed limit is 5 m/s). The student claims that firing the extinguisher was an accident, and he wasn’t speeding before the extinguisher went off. Mr. Q is suspicious, though, and gets out a piece of paper and a pencil…
   1. What was the student’s velocity before he fired the extinguisher?
   2. Should Mr. Q give him a ticket?

Answers: 1) 25.9 m/s 2) 89.9 m [33.4o E of S] 3a) 7.5 m/s [36.9o E of N] 3b) Hell yes!