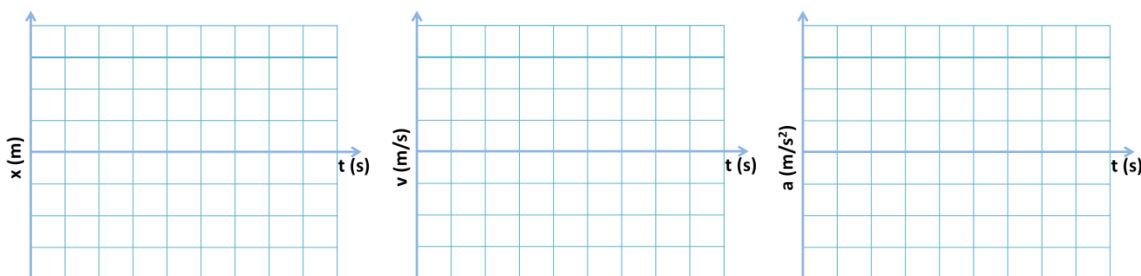


# Worksheet 1.8

Motion Equations; X-direction only

1. Write down the four main equations that describe motion in the x-direction.

2. A hockey puck leaves a player's stick from a position of  $x = 2$  m with a velocity of 25 m/s and moves across the ice with a constant deceleration of  $0.5 \text{ m/s}^2$  due to friction from the ice. Draw  $x$  vs  $t$ ,  $v$  vs  $t$ , and  $a$  vs  $t$  graphs that describe this situation. Make sure to label your axis.



What is  $v_0$ ? \_\_\_\_\_ What is  $x_0$ ? \_\_\_\_\_ What is  $a$ ? \_\_\_\_\_

3. Rewrite the equations from (1) for this system by substituting in the variables provided.

4. What is the velocity of the puck at 1 second?

5. What is the position of the puck at 1 second?

6. How long does it take for the puck to reach the goal that is 5 meters away?

7. How fast is the puck traveling when it reaches the goal?



11. A motorcyclist is traveling 10 m/s is 200 m behind a car at traveling at a steady 20 m/s. How fast must the motorcyclist accelerate in order to pass the car in 5 seconds?

12. A car moving with a velocity of 20 m/s requires 3 m to stop. What is the acceleration of the car while stopping? How far would a car traveling at 40 m/s need to stop assuming the same rate of acceleration as the first car?