Kinematics Equations Review and Practice

1. A car is traveling at 25.0 m/s when it begins to decelerate. If it is slowing down for 15.0 s and ends up with a final velocity of 10.0 m/s how far did it travel?

*(263 m)*

1. Mike the mighty explorer accelerates at a rate of -1.5 m/s2 for 7.5 s. If he was initially traveling at 4.0 m/s how far did he travel?

*(-12 m)*

1. An airplane travels at 125 m/s when it slows to 75 m/s. During this time it travels a distance of 650 m. What was the airplanes acceleration?

*(-7.7 m/s2)*

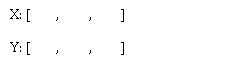
1. A sprinter initially travels at +3.5 m/s when he accelerates at +1.5 m/s2. If he accelerates for 3.0 s what is his final velocity?

*(+8.0 m/s)*

1. The position of a car is measured using an ultrasonic motion sensor. The position and time data is gathered for the first 10 s.

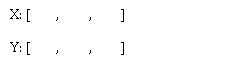
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| Time (s) | Position (m) |
| 0 | 30.0 |
| 1 | 30.4 |
| 2 | 31.7 |
| 3 | 33.8 |
| 4 | 37.0 |
| 5 | 40.6 |
| 6 | 45.2 |
| 7 | 51.0 |
| 8 | 57.5 |
| 9 | 64.4 |
| 10 | 72.7 |

1. Sketch this information on the axis below.



1. What is the proportional relationship that gives you a linear graph?
2. Use a second table of values that will help you create a linear graph of time and position.

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1. Sketch the linear graph.
2. What is the equation of the line of best fit?
3. Use your line of best fit to determine the acceleration of the car.
4. A ball undergoes the acceleration shown in the graph. Use this information to answer the following questions.
5. If the ball starts from rest determine its velocity after 3 s. After 5 s.

*(6m/s; 4m/s)*

1. When does the ball reach its highest velocity?

*(3 s)*

1. Draw a velocity-time graph for the ball.
2. The velocity-time graph below shows the motion of a runaway wheelbarrow. Use this information to answer the following questions.
3. Determine the displacement of the wheelbarrow after 2s, 4s, 5s and 10 s.

*(12m, 18m, 18m, 48 m)*

1. Use the graph and the information in part *a* to sketch a position vs time graph.
2. Determine the slope for each segment of the v-t graph.

*(0m/s2; -3m/s2; 0m/s2; 1 m/s2)*

1. Use the graph to sketch an acceleration vs time graph.
2. When is the wheelbarrow not moving?

*(4s – 5s)*

1. When does the wheelbarrow reach its highest velocity?

*(10 s)*

1. When is the wheelbarrow’s acceleration greatest?
2. The displacement vs time graph below shows the location of a car. Use the graph to answer the following questions.
   1. Determine the cars velocity from t = 0s to t = 7s. Determine the car’s velocity from t = 7s to t = 10s.

*(-2m/s; 0 m/s)*

* 1. What is the acceleration during these intervals?

*(0 m/s2)*

* 1. Draw a velocity vs time graph.