

# Worksheet: Kinematics Part 1 – x (w/ $v_i$ )

$$x = v_{\text{initial}} t + \frac{1}{2} a t^2$$

NAME:

1. Read the following problem
2. Highlight your “proof” for assigning variables
3. List the givens
4. Solve
5. Write your answer with the proper units

A car is already traveling at a speed of 12 m/s when the driver decides to accelerate at  $2.7 \text{ m/s}^2$  for 2.5 seconds. How far does the car travel during this time? - 3 pts -

- Displacement - m, how far
- Initial velocity - m/s, starting from rest, initially/beginning, how fast...
- Acceleration -  $\text{m/s}^2$
- Time - s, how long...

Givens

Work

Answer

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From the top of a cliff, a person used a slingshot to fire a pebble straight downward with an initial speed of 2.20 m/s. After 3.00 s, how far beneath the cliff-top is the pebble? - 3 pts -

- Displacement - m, how far
- Initial velocity - m/s, starting from rest, initially/beginning, how fast...
- Acceleration - m/s<sup>2</sup>
- Time - s, how long...

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A speedboat has a constant acceleration of  $2.0 \text{ m/s}^2$ . If the initial velocity of the boat is  $6.0 \text{ m/s}$ , find its displacement after  $8.0$  seconds. - 3 pts -

- Displacement - m, how far
- Initial velocity - m/s, starting from rest, initially/beginning, how fast...
- Acceleration -  $\text{m/s}^2$
- Time - s, how long...

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A car is initially moving at 10 m/s and accelerates at a constant rate of 2.2 m/s<sup>2</sup> for 4.7 seconds, in a straight line. How far did the car travel during this time? - 3 pts -

- Displacement - m, how far
- Initial velocity - m/s, starting from rest, initially/beginning, how fast...
- Acceleration - m/s<sup>2</sup>
- Time - s, how long...

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A bicyclist approaches the crest of a hill at 4.5 m/s. She accelerates down the hill at a rate of 0.40 m/s<sup>2</sup> for 12 s. How far does she move down the hill during this time interval? - 3 pts -

- Displacement - m, how far
- Initial velocity - m/s, starting from rest, initially/beginning, how fast...
- Acceleration - m/s<sup>2</sup>
- Time - s, how long...

Givens

Work

Answer