

# Worksheet: Kinematics Part 2 - $v_i$

$$v_{\text{final}} = v_{\text{initial}} + at$$

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 runner accelerates to a velocity of 1.77 m/s due west in 3.00 s. His average acceleration is  $0.914 \text{ m/s}^2$ , but directed east. What was his velocity when he began accelerating? - 3 pts -

- Initial velocity - m/s, starting from rest, initially/beginning, how fast...
- Final velocity - m/s, comes to a stop/rest, finally/end, how fast...
- Acceleration -  $\text{m/s}^2$
- Time - s, how long...

Givens

Work

Answer

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During the annual shuffleboard competition, Renee gives her puck an initial speed. Once leaving her stick, the puck slows down at a rate of  $-4.06 \text{ m/s}^2$  and it takes 2.40 seconds to come to a complete stop. Determine the initial velocity of the puck. - 3 pts -

- Initial velocity - m/s, starting from rest, initially/beginning, how fast...
- Final velocity - m/s, comes to a stop/rest, finally/end, how fast...
- Acceleration -  $\text{m/s}^2$
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A cart is rolling to a stop. Friction slows the cart down with an acceleration of  $-1.35 \text{ m/s}^2$ . If the cart slowed down over 2.80 seconds, what was the cart's initial velocity? - 3 pts -

- Initial velocity - m/s, starting from rest, initially/beginning, how fast...
- Final velocity - m/s, comes to a stop/rest, finally/end, how fast...
- Acceleration -  $\text{m/s}^2$
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A skier goes down a slope in 4.56 s with an unknown initial velocity. If the acceleration of the slope is  $2.68 \text{ m/s}^2$  and the skier's final velocity was  $16.8 \text{ m/s}$ , what was the skier's initial velocity? - 3 pts -

- Initial velocity - m/s, starting from rest, initially/beginning, how fast...
- Final velocity - m/s, comes to a stop/rest, finally/end, how fast...
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A curling stone travels across the ice for 1.89 seconds until coming to rest. If the acceleration of the stone is  $-1.67 \text{ m/s}^2$ , what was the stone's initial velocity? - 3 pts -

- Initial velocity - m/s, starting from rest, initially/beginning, how fast...
- Final velocity - m/s, comes to a stop/rest, finally/end, how fast...
- Acceleration -  $\text{m/s}^2$
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A sprinter crosses the finish line and comes to a rest over 1.35 seconds with an acceleration of  $-6.00 \text{ m/s}^2$ .  
What was the sprinter's initial velocity? - 3 pts -

- Initial velocity - m/s, starting from rest, initially/beginning, how fast...
- Final velocity - m/s, comes to a stop/rest, finally/end, how fast...
- Acceleration -  $\text{m/s}^2$
- Time - s, how long...

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