Do Now

- Check the homework.
- Get a whiteboard.
- Write the type of problem that you would like to see solved during the review today.

Rob is 6 feet 2 inches tall. How many meters tall is he? 1in = 2.54cm

$$\frac{6\,ft}{1} \times \frac{12\,in}{1\,ft} = 72\,in + 2\,in$$

$$\frac{74\,in}{1} \cdot \frac{2.54\,cm}{1\,in} \cdot \frac{1\,m}{100\,cm} = \boxed{1.88\,m}$$

How many micrometers are in 7.1 terrameters?

$$\frac{7.1\ \text{Tm}}{1} \times \frac{10^{12}\ \text{m}}{1\ \text{Tm}} \cdot \frac{1\ \mu\text{m}}{10^{-6}\ \text{m}} = 7.1 \times 10^{19}\ \mu\text{m}$$

$1\ \text{Tm} = 10^{12}\ \text{m}$

$1\ \mu\text{m} = 10^{-6}\ \text{m}$

A classroom has a volume of 273 m^3.
What is the volume in cm^3?

$$\frac{273\ m^3}{1} \cdot \frac{100\ cm}{1\ m} \cdot \frac{100\ cm}{1\ m} \cdot \frac{100\ cm}{1\ m}$$

$$= 2.73 \times 10^8\ cm^3$$

$$\frac{273\ m^3}{1} \cdot \frac{100^3\ cm^3}{1^3\ m^3} = 2.73 \times 10^8\ cm^3$$

How many cm^3 in $0.03\,km^3$

$$\frac{0.03\,km^3}{1} \cdot \frac{1000^3\,m^3}{1\,km^3} \cdot \frac{100^3\,cm^3}{1\,m^3} =$$

$$3 \times 10^{13}\,cm^3$$

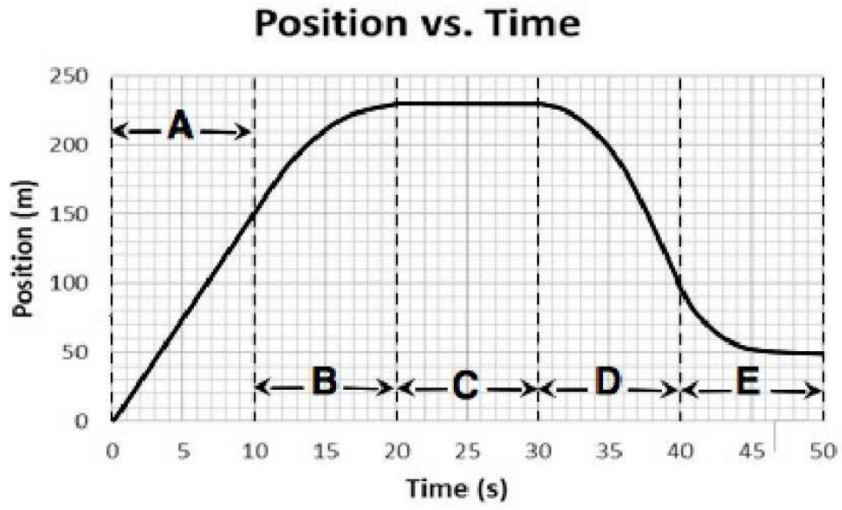
Fill in the blank

magnitude: absolute Value

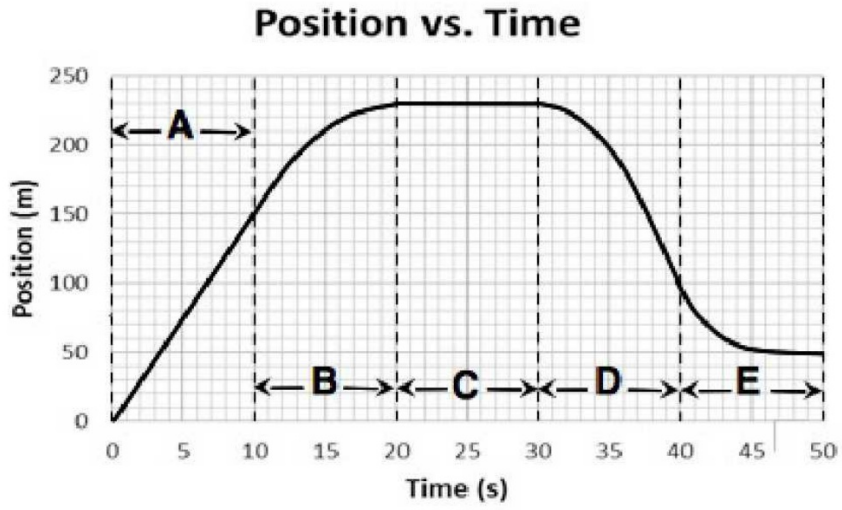
- The slope on a Position vs. Time graph indicates _____Velocity_____.
- The slope on a Velocity vs. Time graph indicates _____acceleration_____.

Fill in the blank

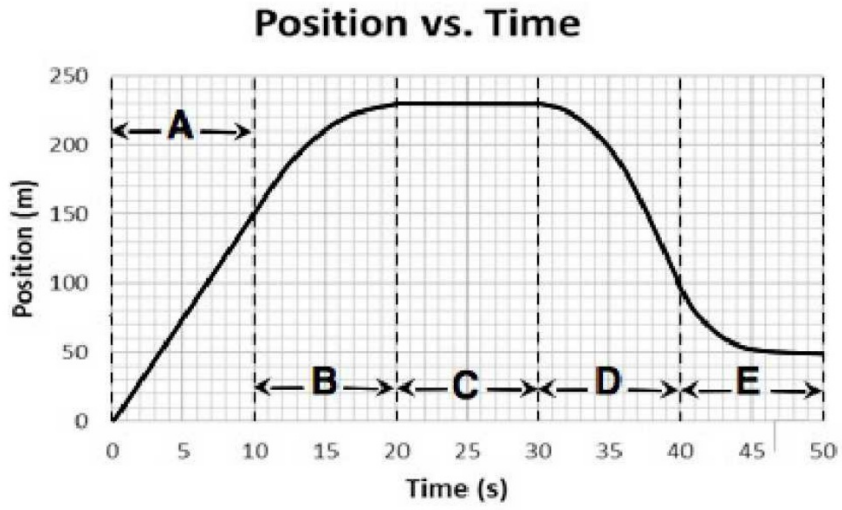
- The area between the curve of velocity (on a Velocity vs. Time graph) and the horizontal axis indicates displacement
- The difference between a vector and a scaler is that a vector requires both magnitude and direction to fully describe it.



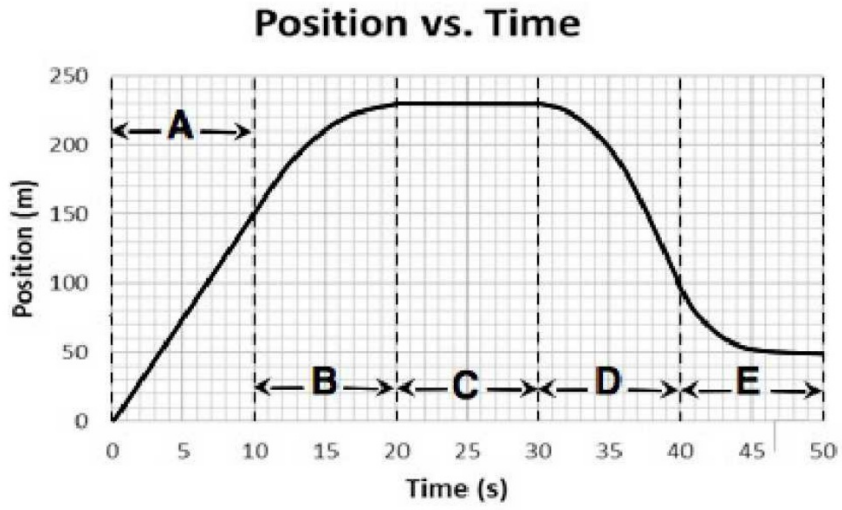
From 0 to 10 seconds, the unicyclist is constant velocity in the positive direction.



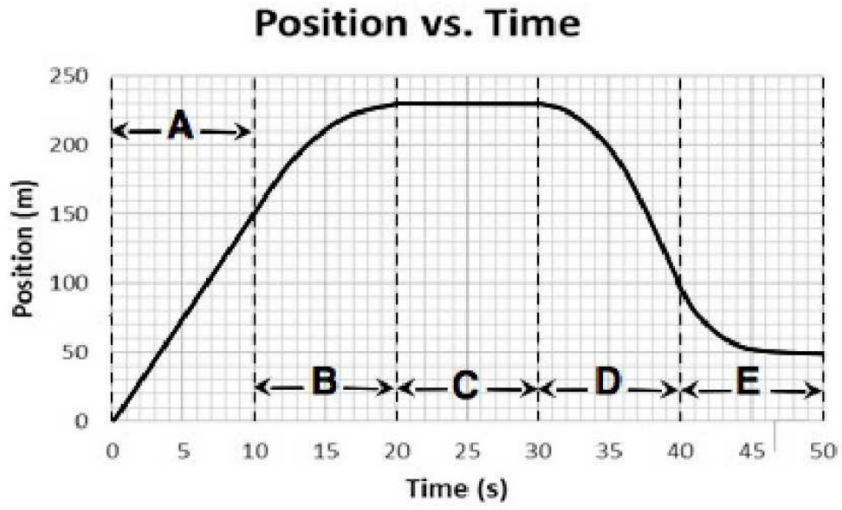
From 10 to 20 seconds, the unicyclist is neg acceleration in the positive direction.



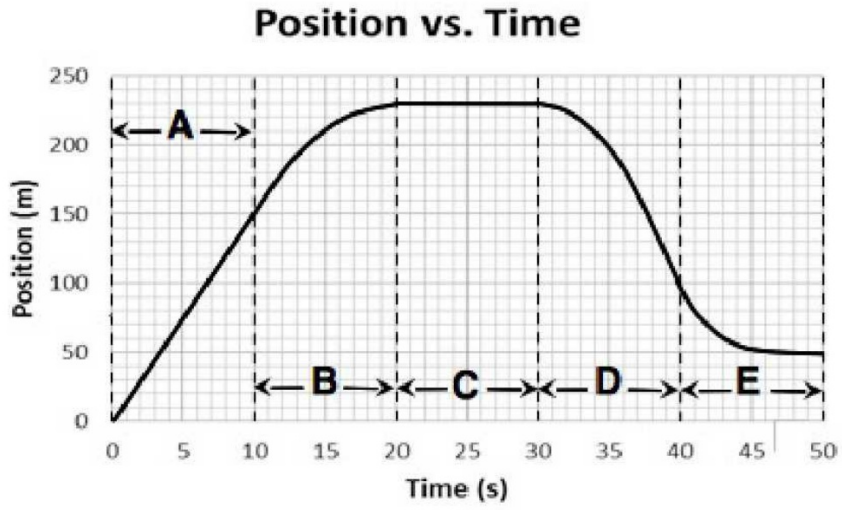
From 20 to 30 seconds, the unicyclist is const velocity in the _____ direction.



From 30 to 40 seconds, the unicyclist is accelerating in the neg direction.

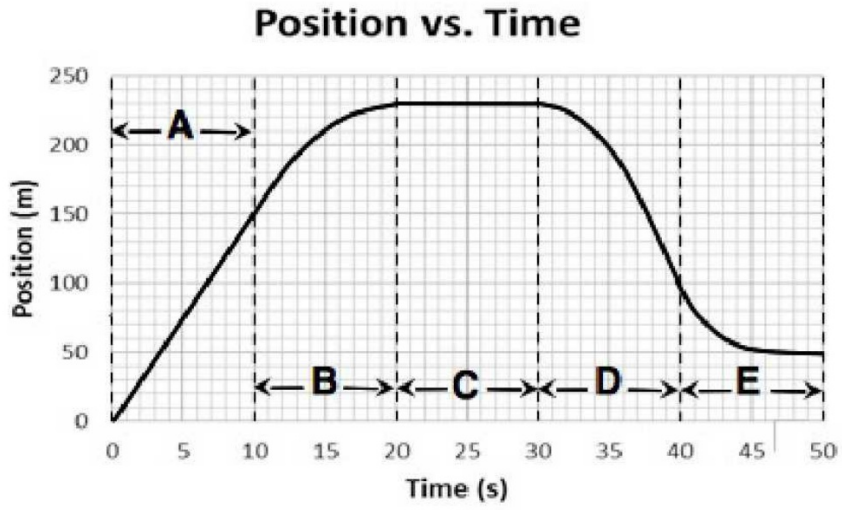


From 40 to 50 seconds, the unicyclist is slowing down in the neg direction.



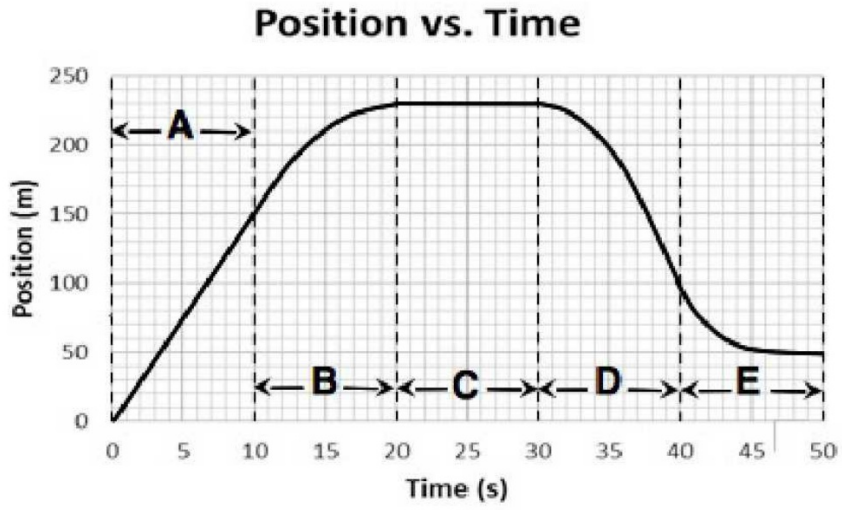
What is the average velocity of the unicyclist from t = 30 to 40 seconds?

-12.5m/s

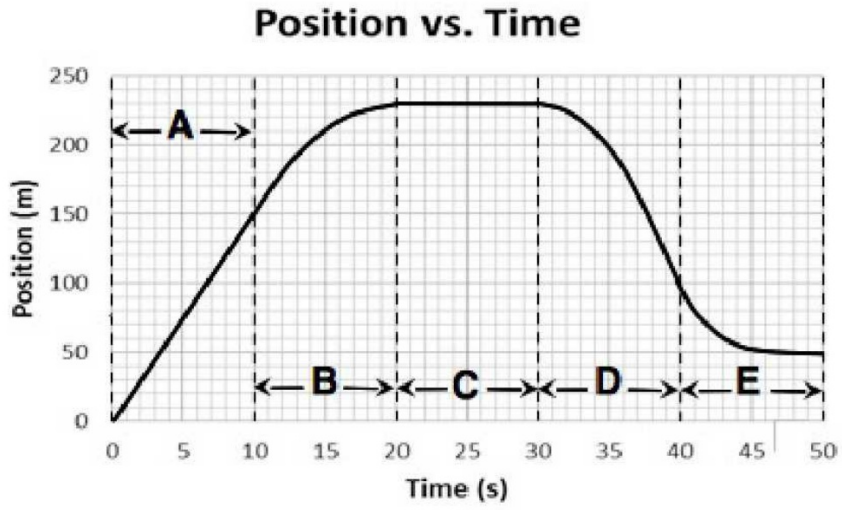


What is the instantaneous velocity at t = 6 seconds?

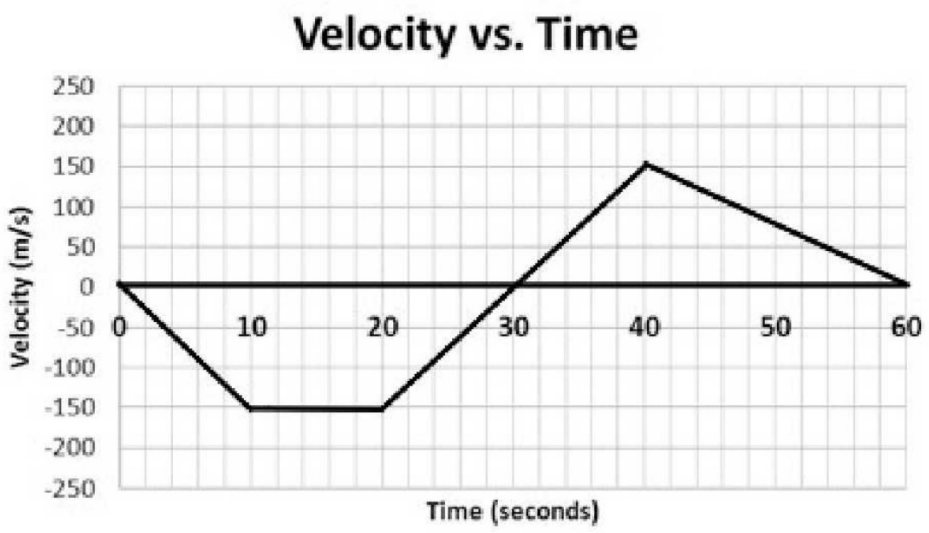
15m/s



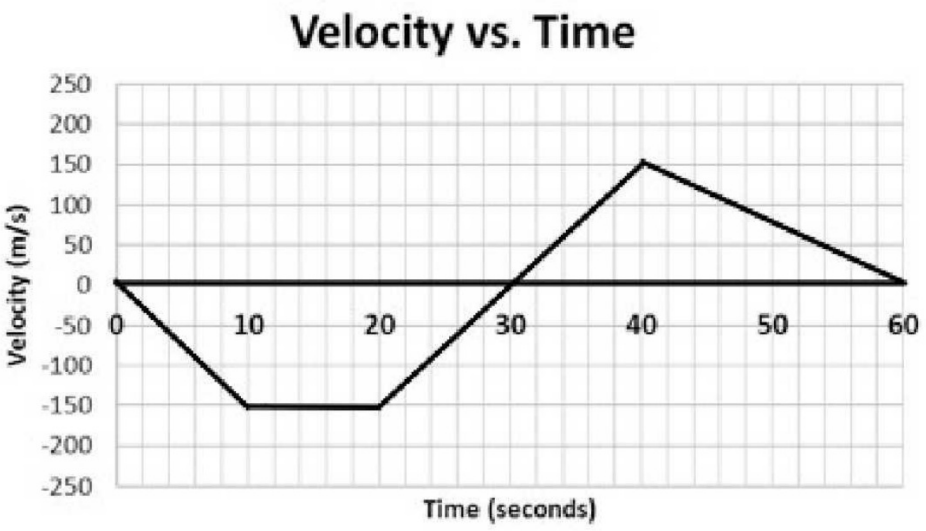
What is the average speed of the unicyclist for the entire trip? 8m/s



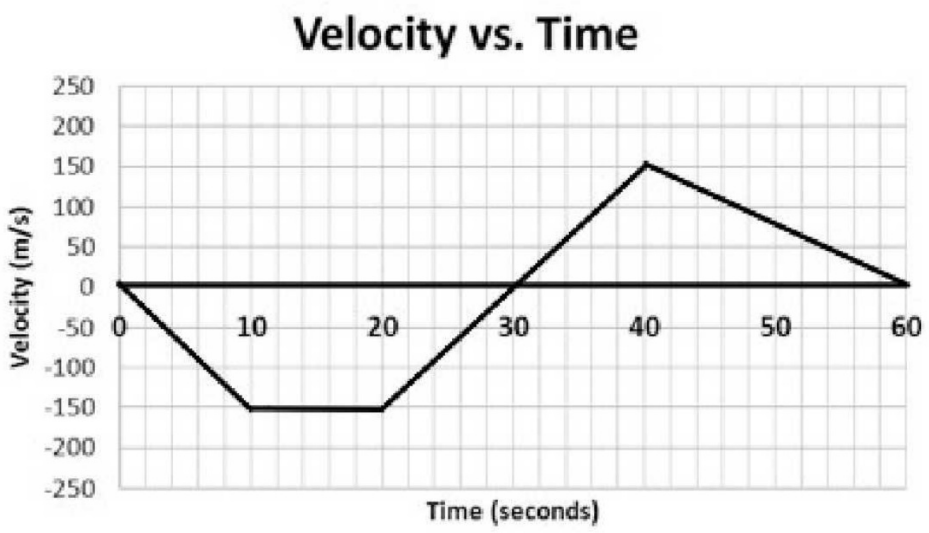
What is the average velocity of the unicyclist for the entire trip? 1m/s



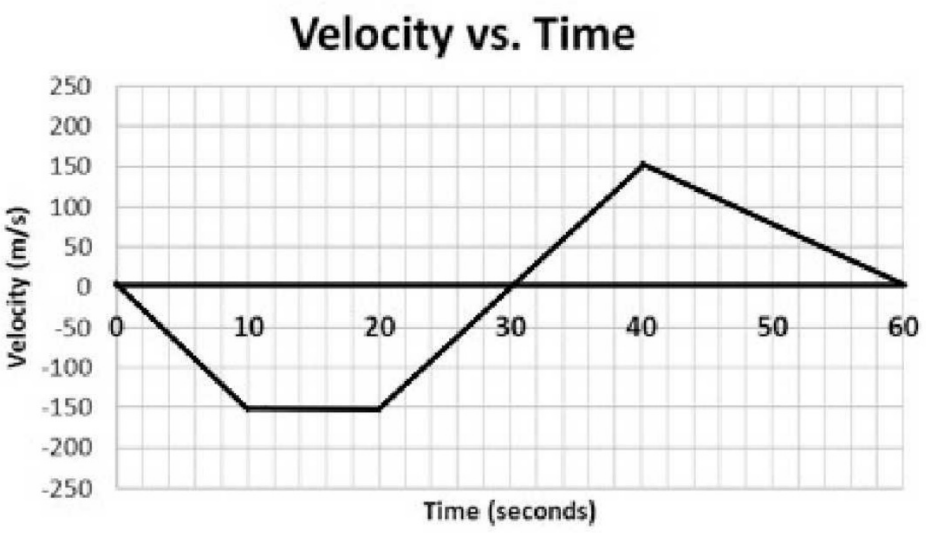
From 0 to 10 seconds, the particle is accelerating in the neg direction.



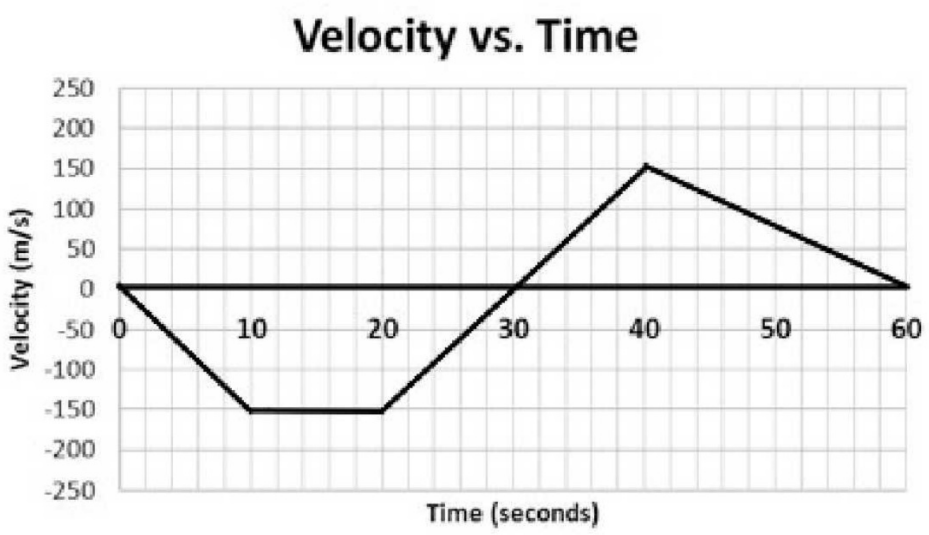
From 10 to 20 seconds, the particle is @ const. Velocit in the neg direction.



From 20 to 30 seconds, the particle is Slowed down in the neg direction.



From 40 to 60 seconds, the particle is Slowing down in the pos direction.



What is the total displacement of the particle over the 60 second time period?

Constant Velocity Lab

- Check the grade on IC.
- I will take general and specific questions after all labs have been returned.

A baseball pitcher throws a 27 m/s fastball toward the batter, 10 meters away. The batter hits a line drive right over the pitcher's head into center field. The fielder stops the ball 6 seconds after it is hit, 30 meters from home plate. He hesitates for 1.3 seconds and then throws the ball at 19 m/s to the second baseman, who catches the ball 2 seconds later.

- How long does it take for the ball to travel to home plate?

$$t V = \frac{\Delta x}{t} t \Rightarrow \frac{t V}{V} = \frac{\Delta x}{V}$$

$$t = \frac{\Delta x}{V} = \frac{10 m}{27 m/s} = 0.375$$

A baseball pitcher throws a 27 m/s fastball toward the batter, 10 meters away. The batter hits a line drive right over the pitcher's head into center field. The fielder stops the ball 6 seconds after it is hit, 30 meters from home plate. He hesitates for 1.3 seconds and then throws the ball at 19 m/s to the second baseman, who catches the ball 2 seconds later.

- Find the ball's average velocity on its trip from the batter to the outfielder.

$$V = \frac{\Delta x}{t} = \frac{30\text{m}}{6\text{s}} = 5\ \text{m/s}$$

A baseball pitcher throws a ___ m/s fastball toward the batter, ___ meters away. The batter hits a line drive right over the pitcher's head into center field. The fielder stops the ball __ seconds after it is hit, 30 meters from home plate. He hesitates for .3 seconds and then throws the ball at 19 m/s to the second baseman, who catches the ball 2 seconds later.

- Find the distance from outfielder to second base.

$V = 19\ m/s$

$t = 2\ s$

$tV = \frac{\Delta x}{t} t$

$\Delta x = tV = 19\ \frac{m}{s} \cdot 2\ s = 38\ m$

A baseball pitcher throws a ___ m/s fastball toward the batter, ___ meters away. The batter hits a line drive right over the pitcher's head into center field. The fielder stops the ball __ seconds after it is hit, ___ meters from home plate. He hesitates for __ seconds and then throws the ball at ___ m/s to the second baseman, who catches the ball ___ seconds later.

- Describe the motion of the baseball with a quantitative position-time graph, a quantitative velocity-time graph

A jet is traveling 57 m/s at liftoff, 12 seconds later the jet has a speed of 93 m/s. Find its acceleration.

K: $V_i = 57 \frac{m}{s}$, $t = 12s$, $V_f = 93 m/s$

U: a

Eqn: $V_f = V_i + at \Rightarrow a = \frac{V_f - V_i}{t}$

$a = \frac{93 m/s - 57 m/s}{12s} = 3 m/s^2$

A jet is traveling 57 m/s at liftoff, 12 seconds later the jet has a speed of 93 m/s. Draw a V-t graph. Find its displacement.