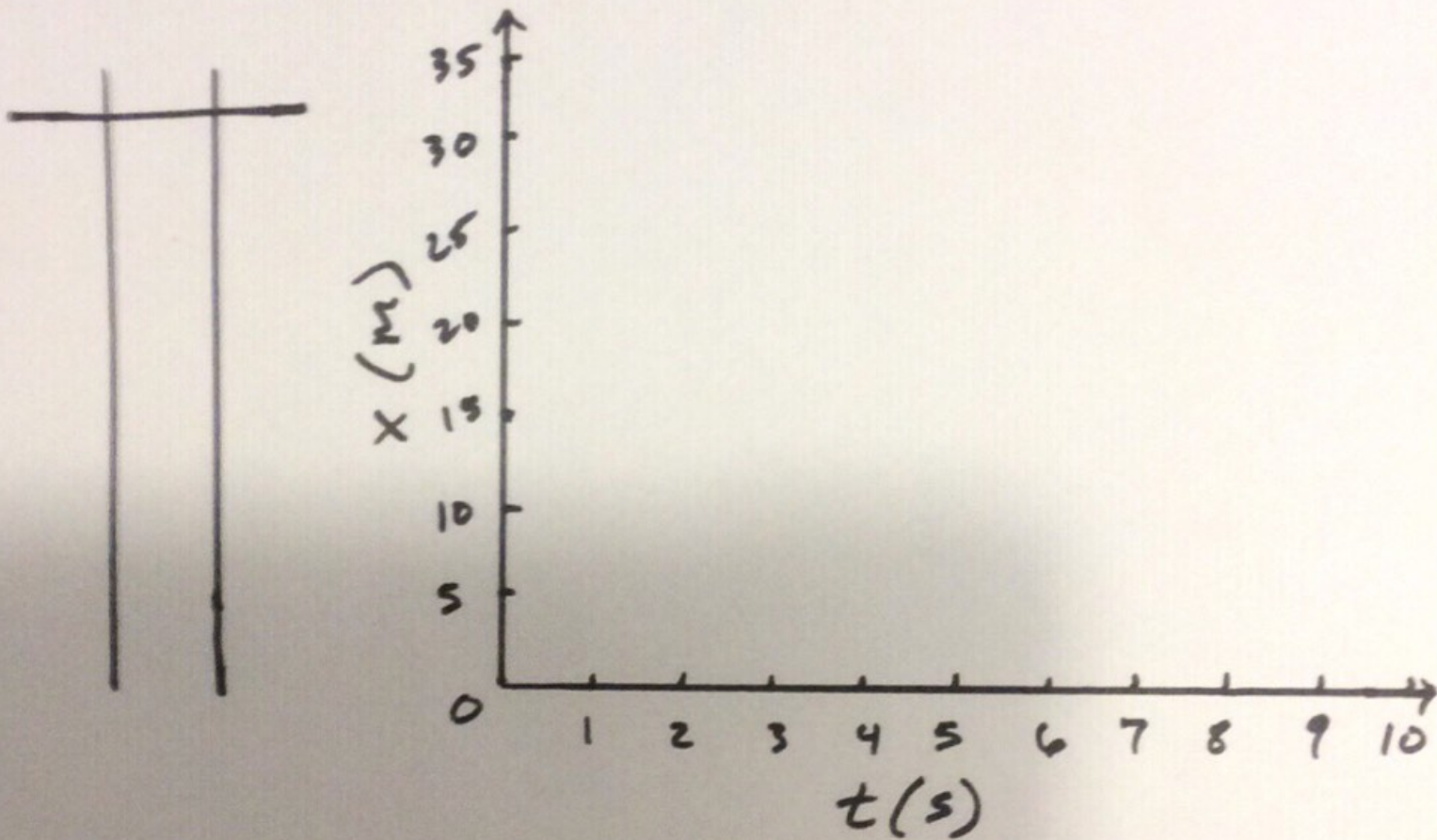


Constant Velocity Lecture 1

• 30m • 25m • 20m • 15m • 10m • 5m • 0



What is the slope of the x-t graph?

As goes the slope, so goes the _____.

$$\text{Average Velocity} = \frac{\Delta x}{\Delta t} = \frac{\text{change in position}}{\text{change in time}}$$

Scalar vs. Vector

Scalar

Just a magnitude.

Distance: How much "ground" something has traveled.

Average Speed:

$$\text{Speed} = \frac{\text{distance}}{\text{time}}$$

Instantaneous Speed:

Speed at a specific moment in time.

Vector

A magnitude plus a direction.

Displacement: How far away from the original spot something has moved.

$$\Delta X = X_f - X_i$$

Change in position.

$$\text{Average Velocity} = \bar{V} = \frac{\Delta X}{\Delta t}$$

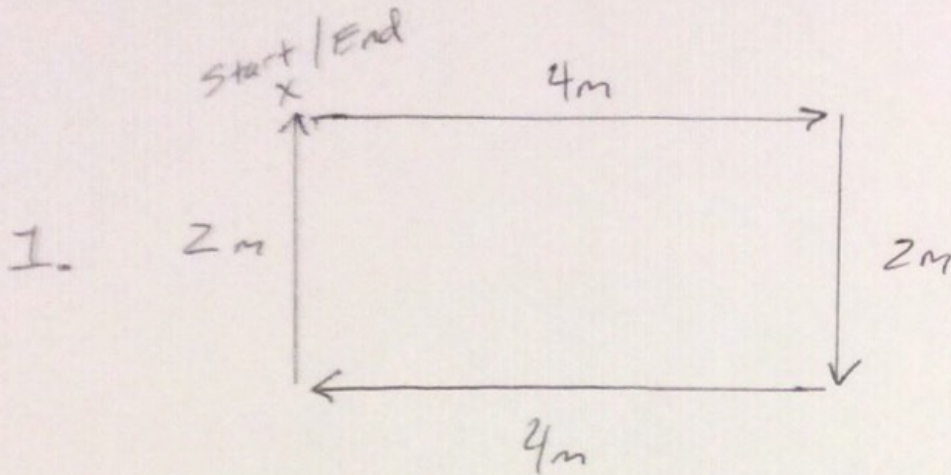
$$\text{Avg. Velocity} = \frac{\text{displacement}}{\text{time}}$$

Instantaneous Velocity:

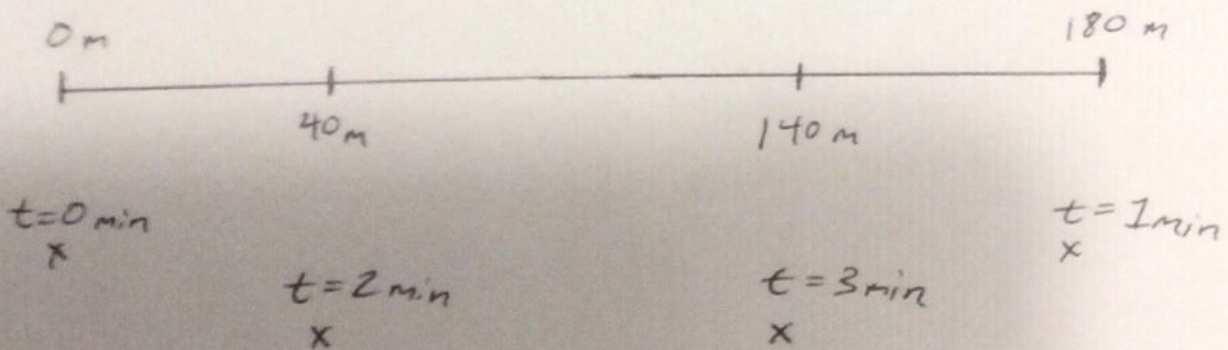
Velocity at a specific moment in time.

What is the total distance?

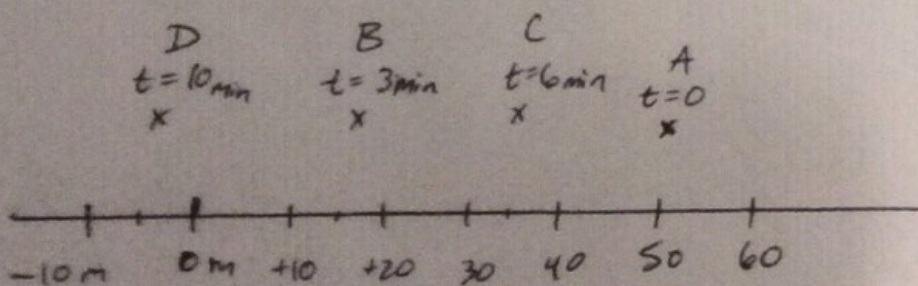
What is the total displacement?



2. Back and Forth Motion in 1 Dimension

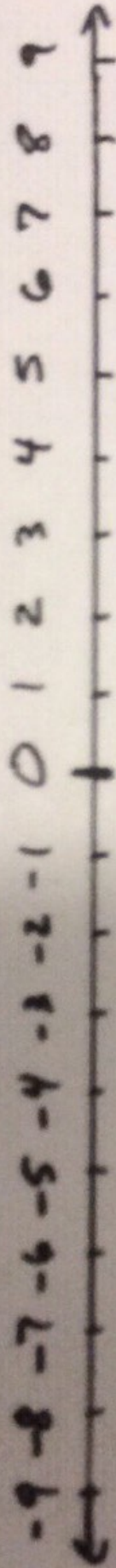


3.

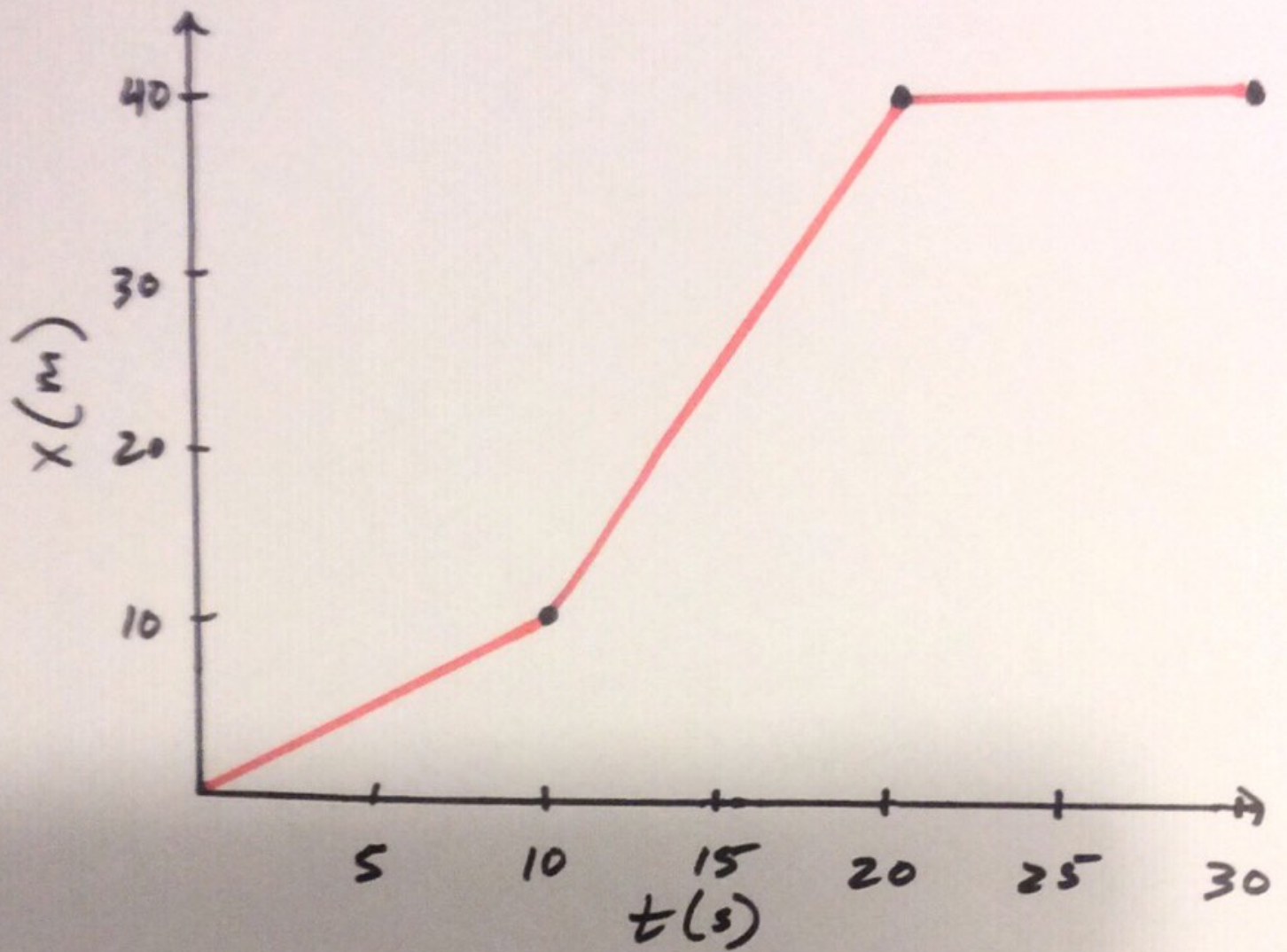


Displacement Vectors

Position Number
Line

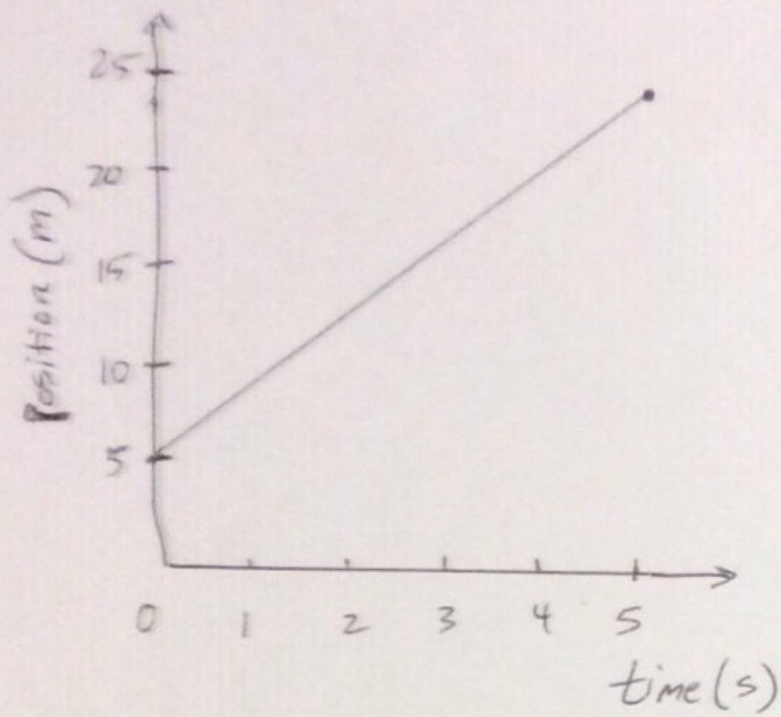


Constant Velocity Lecture 2



What is the average velocity from 0 to 30s?

What are the instantaneous velocities

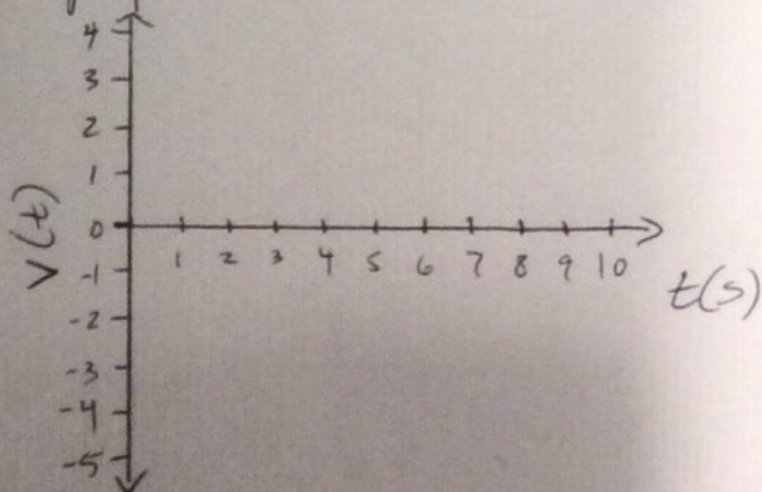
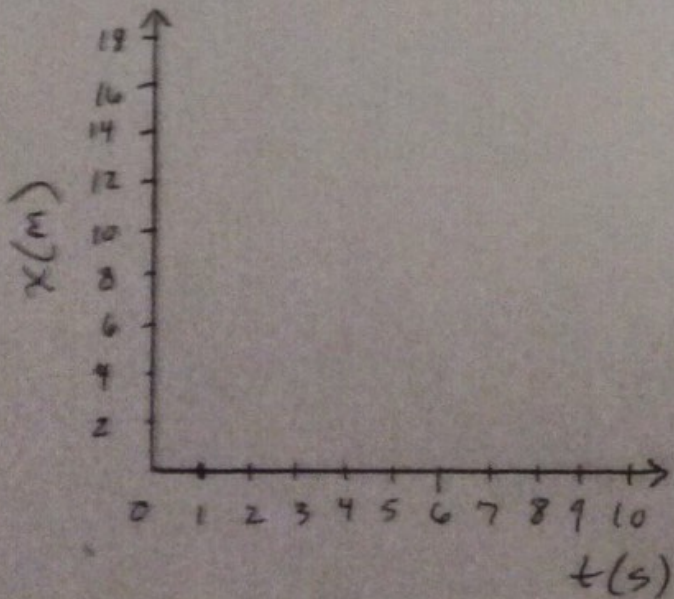


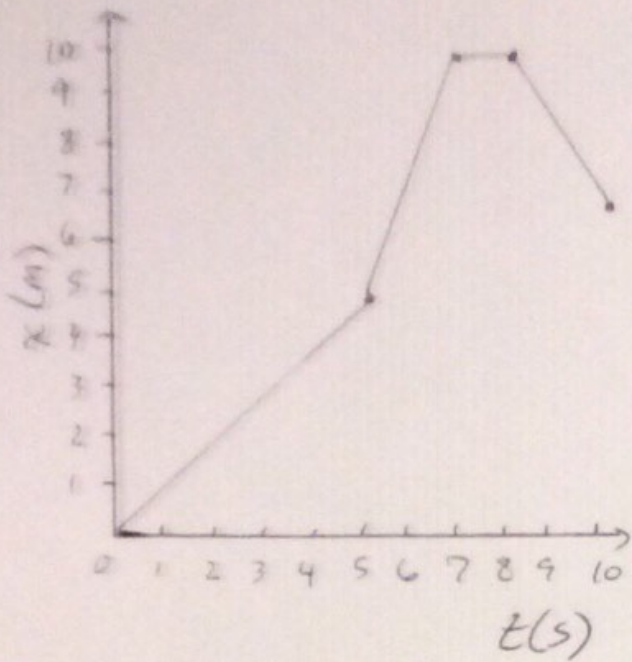
What do we know about the motion of this object?

What is the avg. velocity?

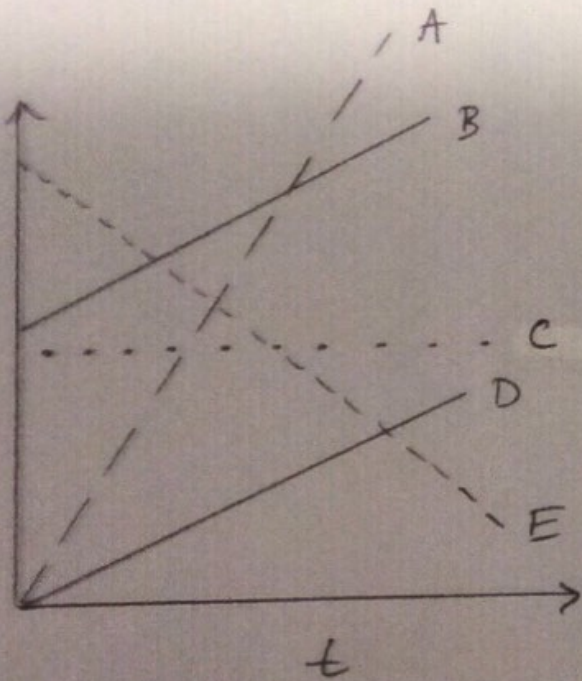
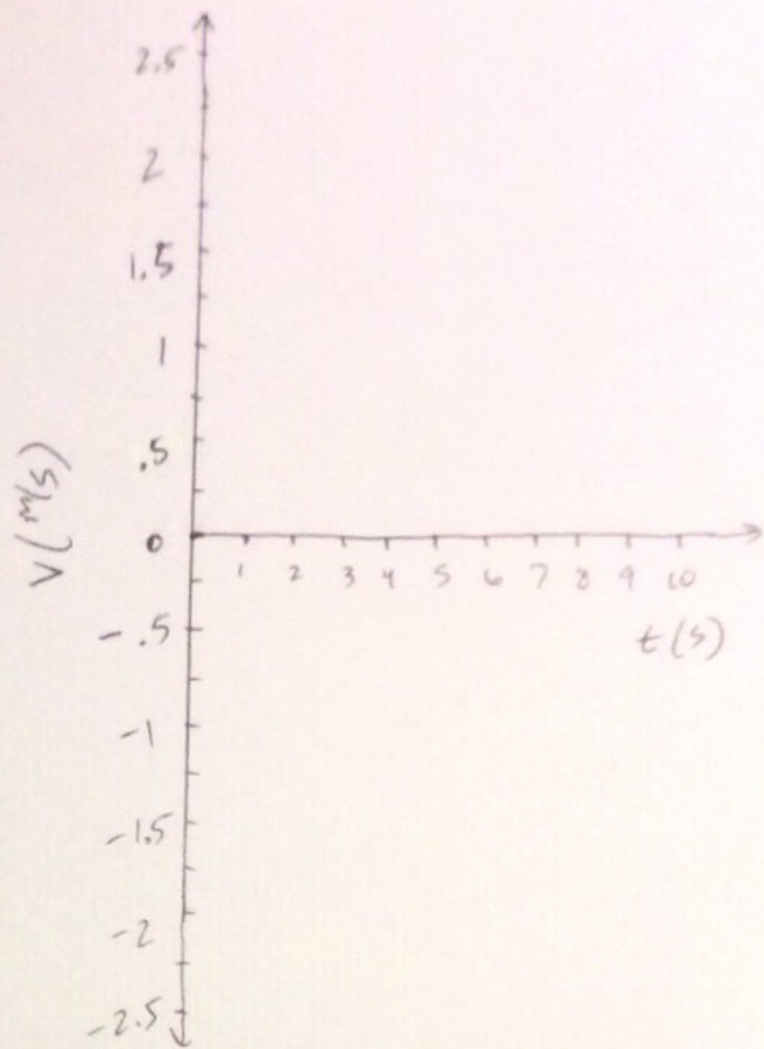
What is the math expression of this object

An object starts +10 m away from the origin, walks at a constant +2 m/s for 2 seconds, stops for 1 second, then walks towards the origin going -1 m/s for 4 seconds. Sketch the x-t and v-t graphs.





Fill in the v-t graph based on the x-t graph.



Rank from lowest to highest:

a. Speed

b. Velocity

A train travels east at $+30 \text{ m/s}$ beginning at position 0 m . A second train begins at position $+10,000 \text{ m}$ and travels at -40 m/s west. Assume the trains are on a parallel track system.

a.) At what time in seconds will the trains meet?

b.) At what position will the trains meet?

c.) Sketch the $x-t$ graph for the trains.

