LET'S DO AN EXPERIMENT!

In groups of 4, measure the amount of time it takes each person in the group to text "lol" and hit "send"

- Each person will text, and while you are texting, the other 3 group members will be timing the text with their stopwatches.
- Average the 3 times to get the time for "name 1", then average all four of you to get your "group average".
- Then tell me your group average

THINK OF 1-2 EXAMPLES WHERE INSTANTANEOUS VELOCITY MIGHT BE ZERO BUT ACCELERATION IS NOT ZERO

Hint: Acceleration due to gravity is a thing!

GOALS FOR TODAY

Acceleration practice

Graphing representations

Continue Text LOL

REVIEW FROM YESTERDAY

What is the standard unit for distance/displacement?

- Meters (m)

What is the standard unit for speed/velocity?

- Meters per second (m/s)

What is the standard unit for acceleration?

- Meters per second squared (m/s^2)

EXAMPLE #1

The California Screamin' ride at California Adventure accelerates from 0 to 89 km/hr in 4.0 seconds at launch. What is its acceleration in m/s^2?

- *Ans* $= 6.2\ m/s^2$

EXAMPLE #2

You're driving down the 2 Freeway at 26 m/s when you see traffic up ahead, so you brake to 12 m/s in 7.0 seconds. What is your acceleration?

- *Ans* = *-2.0 m/s²*

What does the negative sign mean?

REPRESENTATIONS

We've done numerical & conceptual problems related to distance/displacement, speed/velocity, and acceleration

Let's graph!

POSITION VS. TIME GRAPHS

- Draw a position vs. time graph for a car moving at a constant 5 m/s.

VELOCITY/SPEED VS. TIME GRAPHS

- What does the velocity vs. time graph look like for a car moving at a constant 5 m/s?

POSITION VS. TIME GRAPHS

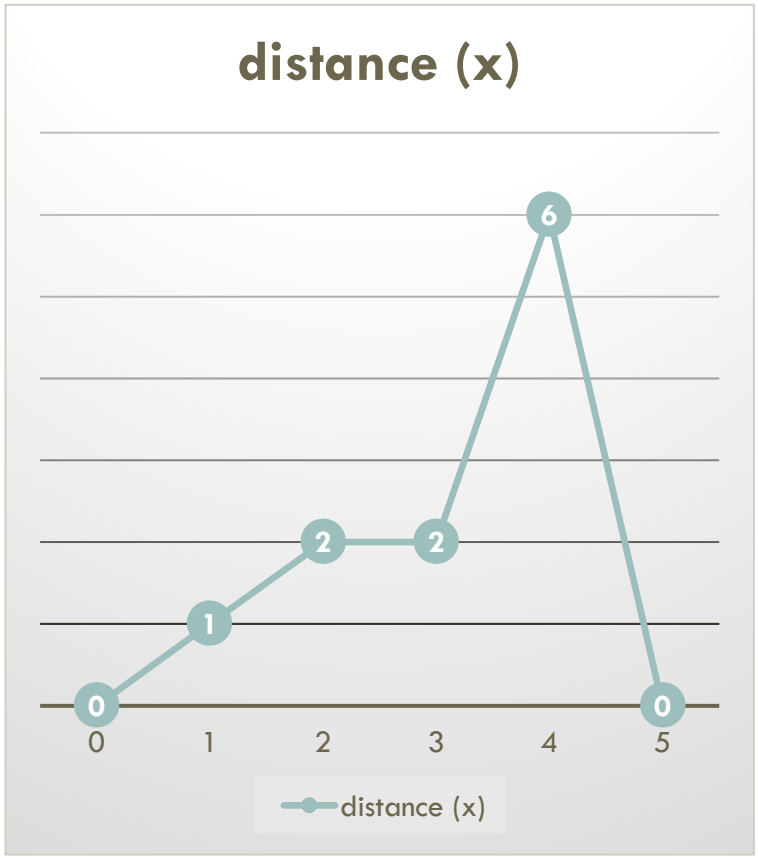
time (t, s)	Position (x, m/s)
0	0
1	1
2	2
3	2
4	6
5	0

- A cheetah runs to the right 2 meters in 2 seconds, then stops for one second, then runs 4 meters to the right in one second, then abruptly runs back to where it started in one second.
- What would this look like in graph form?
- What is the slope of the graph between t = 0 and t = 2s?

VELOCITY VS. TIME GRAPHS

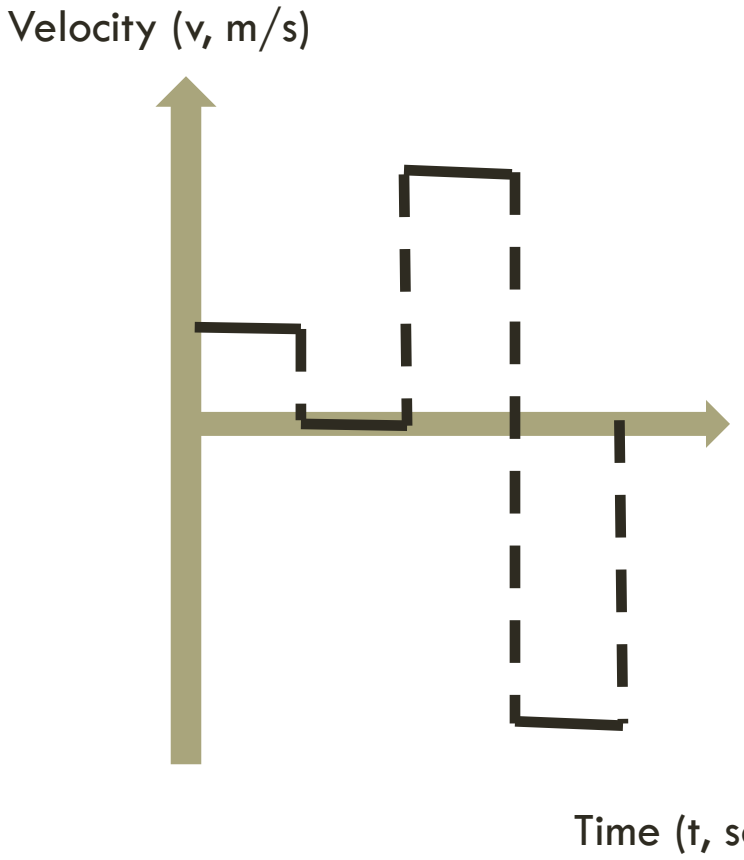
- What does the **velocity vs. time graph** look like in this example?
- What is the area under the v vs. t curve?
  - Displacement!

POSITION VS. TIME GRAPHS



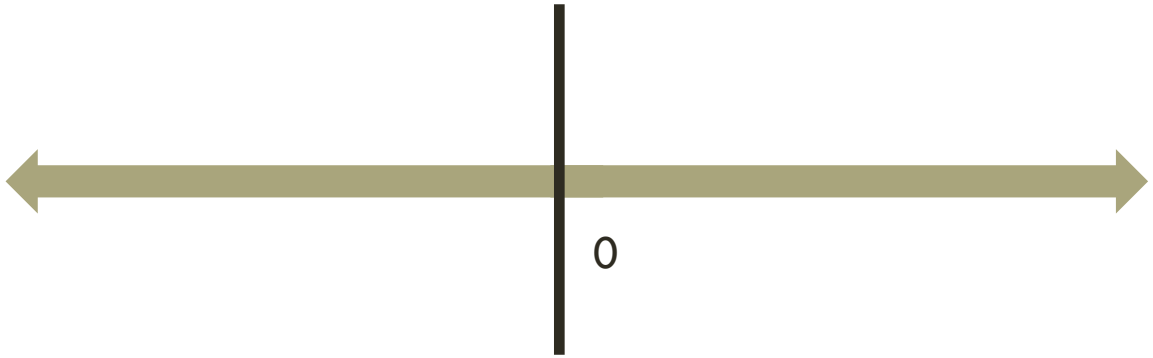
- What would the velocity vs. time graph look like?
- What is the area under the v vs. t curve?
  - Displacement!

VELOCITY VS. TIME GRAPH FOR OUR CHEETAH EXAMPLE

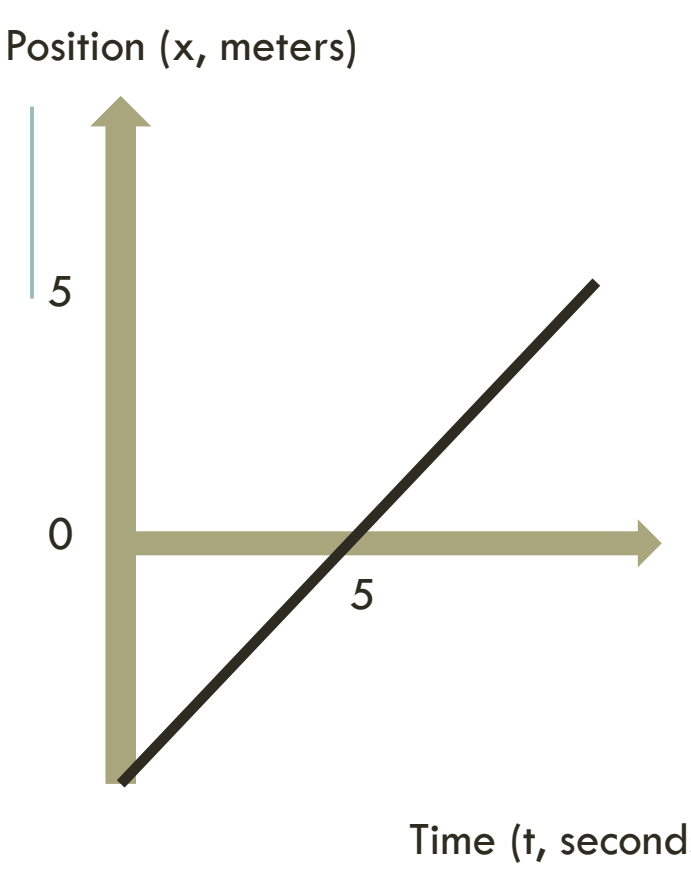


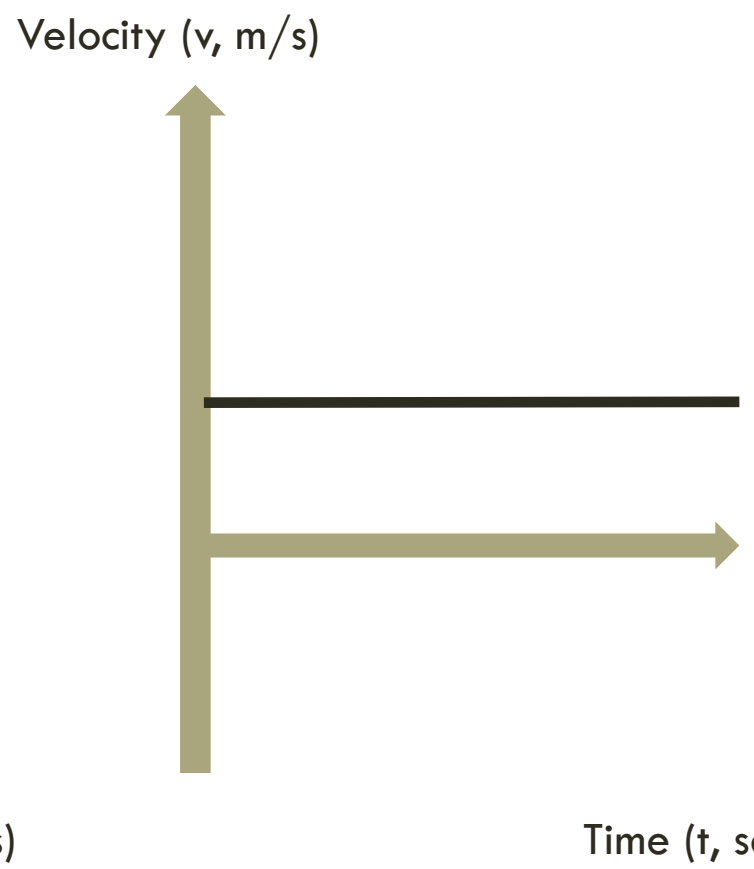
- What is the area under the v vs. t curve?
  - Displacement!

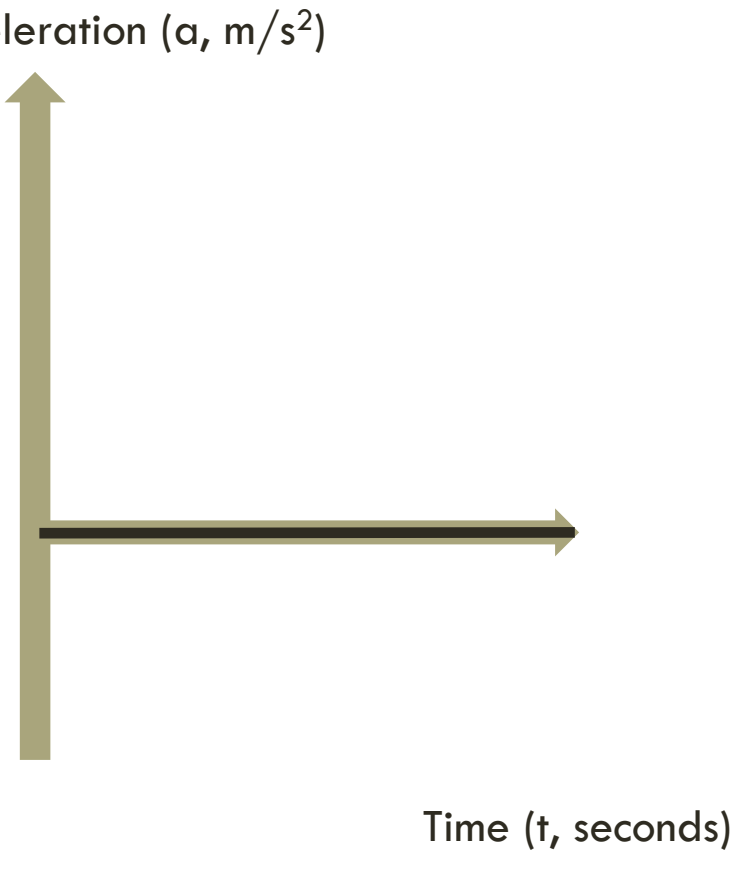
A FEW CONVENTIONS

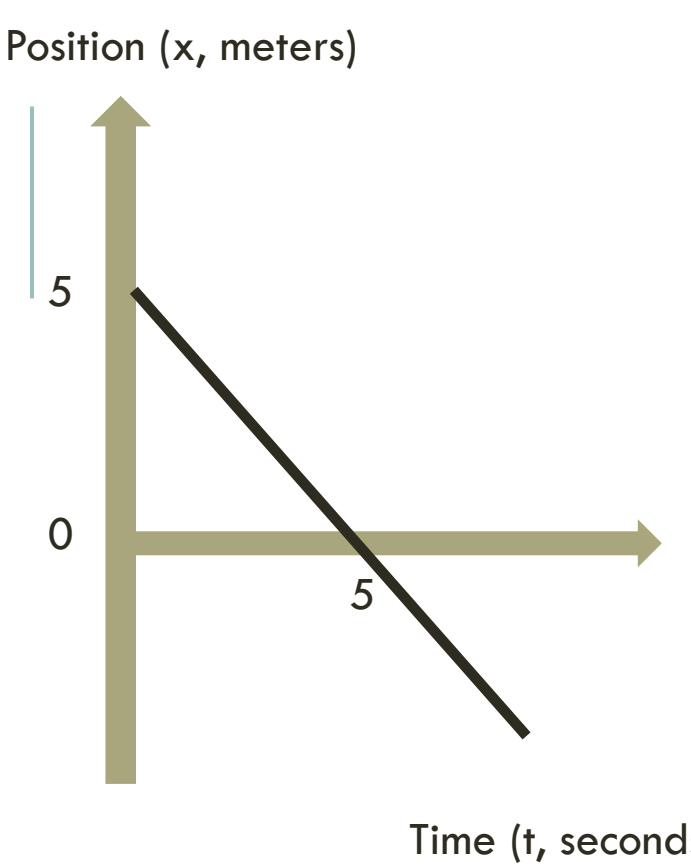


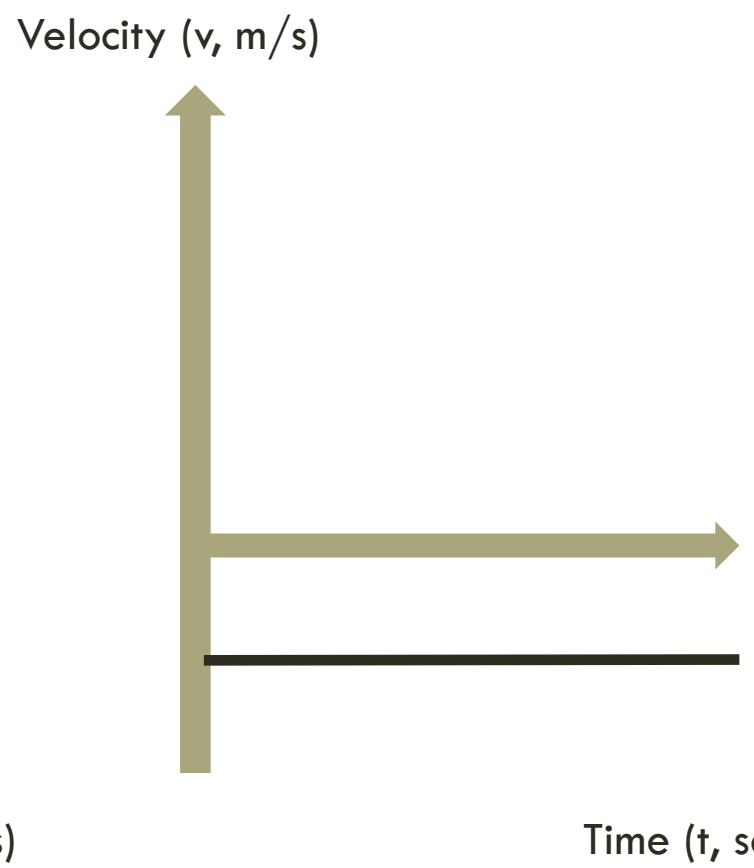
- We assume **left** is the **negative x-direction**
- We assume **right** is the **positive x-direction**
- Later - up is the positive y-direction, and down is the negative y-direction

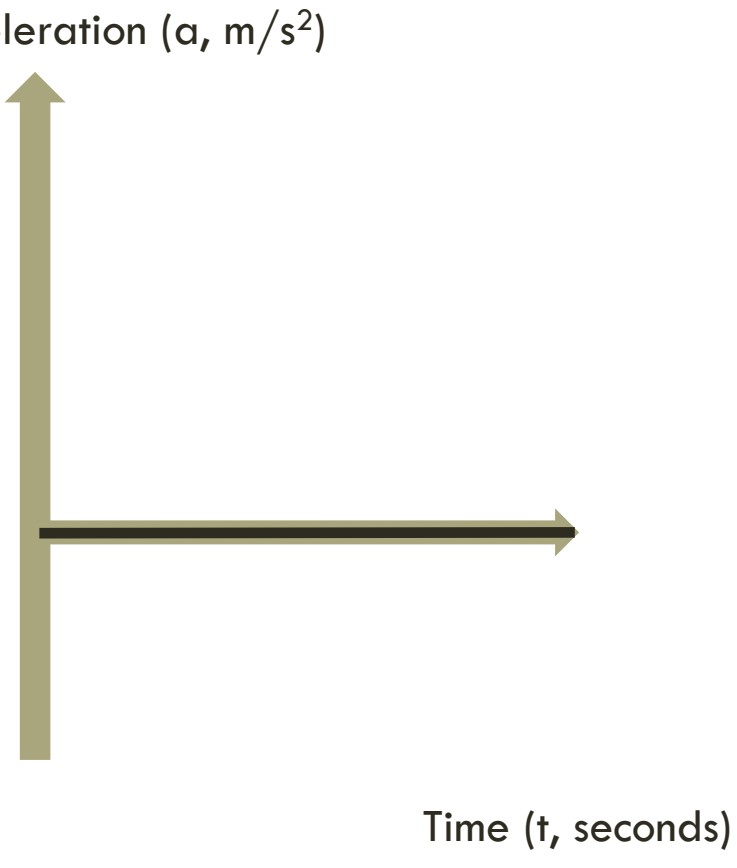

Position (x, meters)
5
0
5
Time (t, seconds)


Velocity (v, m/s)
Time (t, seconds)

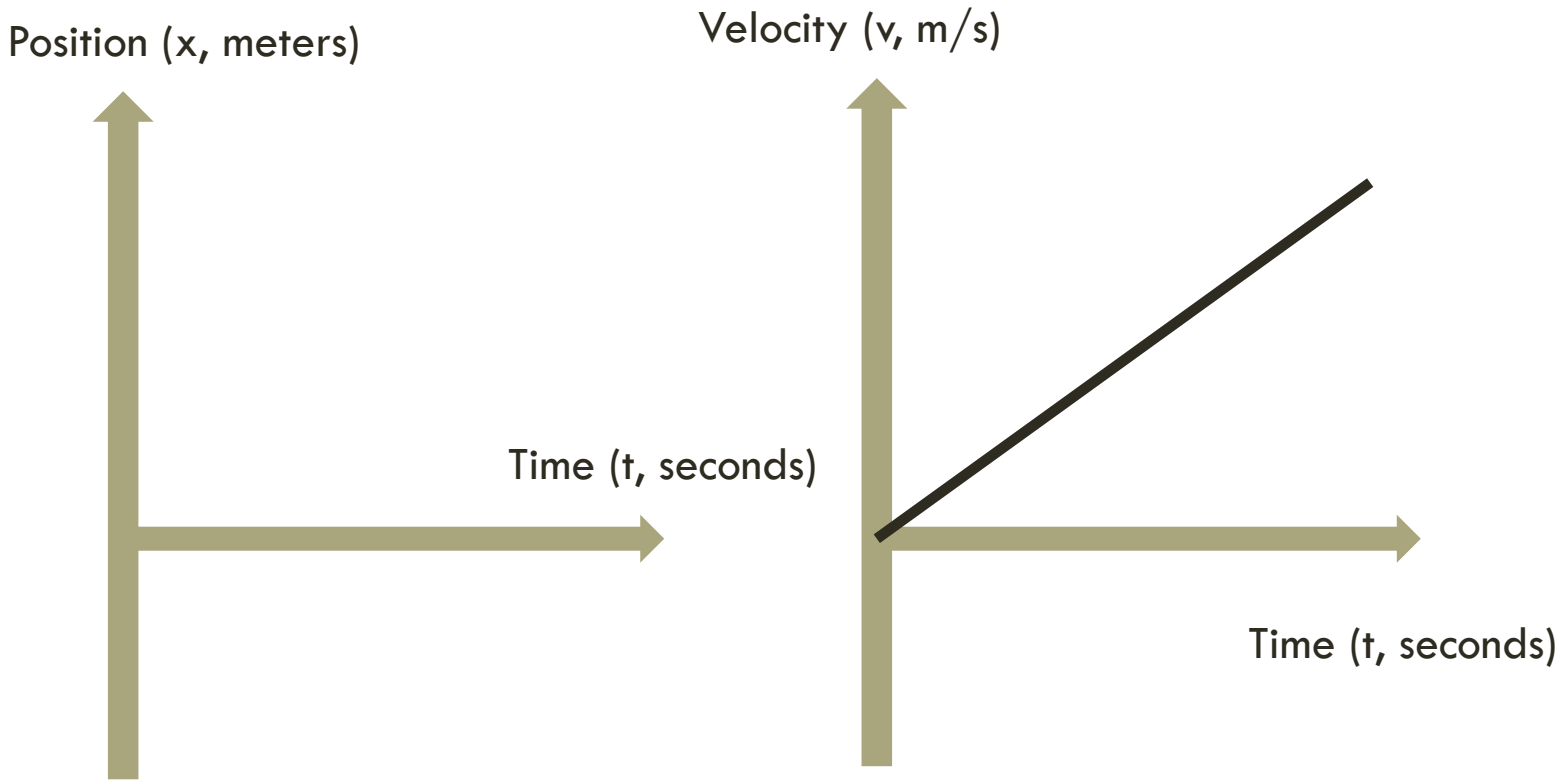

Acceleration (a, m/s2)
Time (t, seconds)

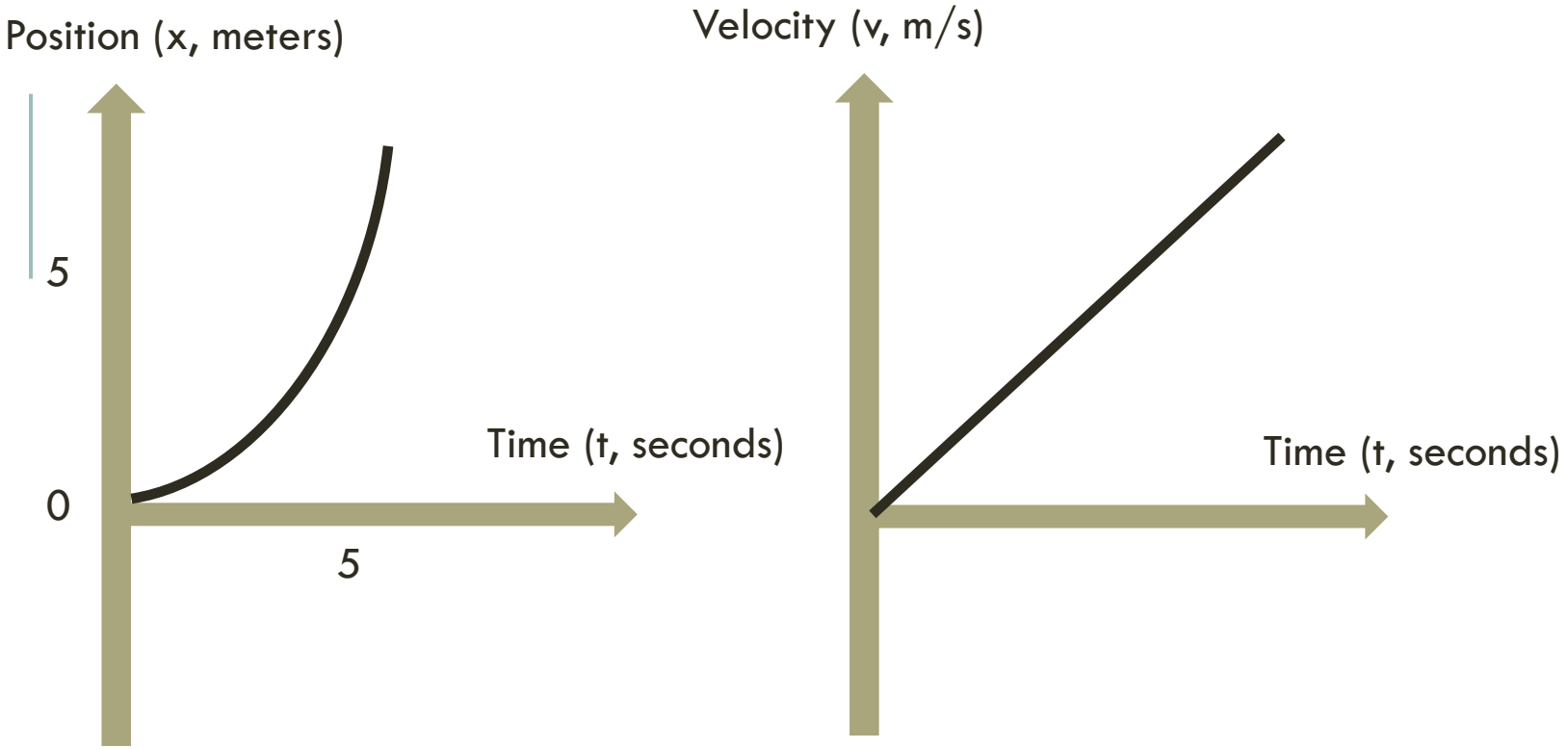

Position (x, meters)
5
0
5
Time (t, seconds)


Velocity (v, m/s)
Time (t, seconds)


Acceleration (a, m/s2)
Time (t, seconds)

ALL OUR GRAPHS HAVE BEEN CONSTANT VELOCITY – WHAT HAPPENS WHEN VELOCITY IS NOT CONSTANT?




Position (x, meters)
5
0
Time (t, seconds)
5
Velocity (v, m/s)
Time (t, seconds)

TAKE A LOOK AT YOUR LINEAR MOTION GRAPHS WS1