Announcements – 3 Sep 2013

1. Welcome to Physics 105! I'm Dr. Colton

2. Prayer
   - Prayer sign-up, https://docs.google.com/spreadsheet/ccc?key=0Ame3-9U45-VddGp6UWFDZ2IjTlZEVlhPaW12bGpISkE&usp=sharing

3. Answer to a common question:
   - The Physics 107 Lab is completely separate from this course, since it's not required for all majors. I know practically nothing about it.

4. As most of you have found out already, I send out periodic class-wide emails. Make sure your myBYU email address is current.

5. TA: Shaun Livingston

Introductory Stuff

Class website

Syllabus

- Learning outcomes
- Letter grade boundaries
- Grading categories: warmup quizzes, clicker quizzes, HW, exams, final

Learning Suite

- “Digital Dialog” only (class discussion forum)
- Will start after add/drop deadline

Max

- CID
- Register clicker
- Calendar
- Warmups (due 15 mins before class)
- HW (due 11:59 pm)
- Checking your grade

More stuff you should know from syllabus:

- Four free warmup quizzes
- Four free clicker quizzes
- Four free late HW
- Additional Resources
- Cheating
- Extra Credit
- BYU Policies

Read about them on your own!

Extra documents at the end of the syllabus

- Free body diagram instructions
- How to solve physics problems: PEANuT
- How to study for this physics course
- Reading effectively
- Extra credit book list
- Chapter summaries of mathematical relations
- List of equations for exams
- Forms for you to use to turn in FBDs

Read about them on your own!

The best study aid: the other students! Take two minutes now to exchange names/numbers/ emails with 3-4 people sitting near you.

First clicker quiz:

I now have the names/numbers/emails of 3-4 other people in the class.

a. True

Pause for questions…

…and now, for the Physics

Chapter 1: Units/Trigonometry

→ skipped, but you do need to know

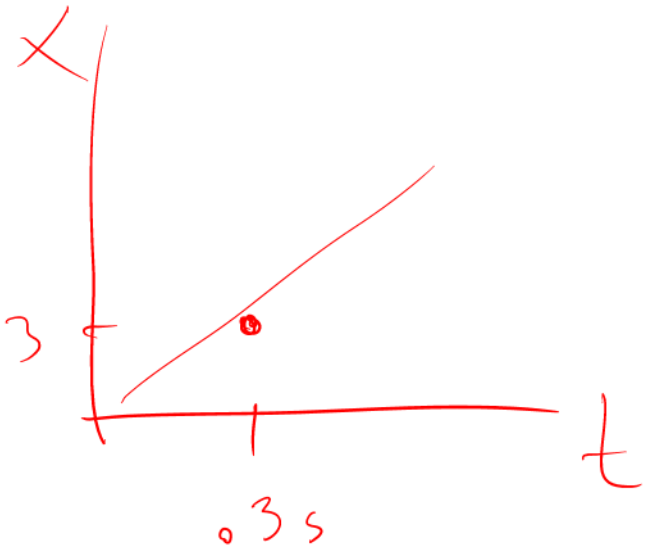
- how to convert units
- how to do basic Trig

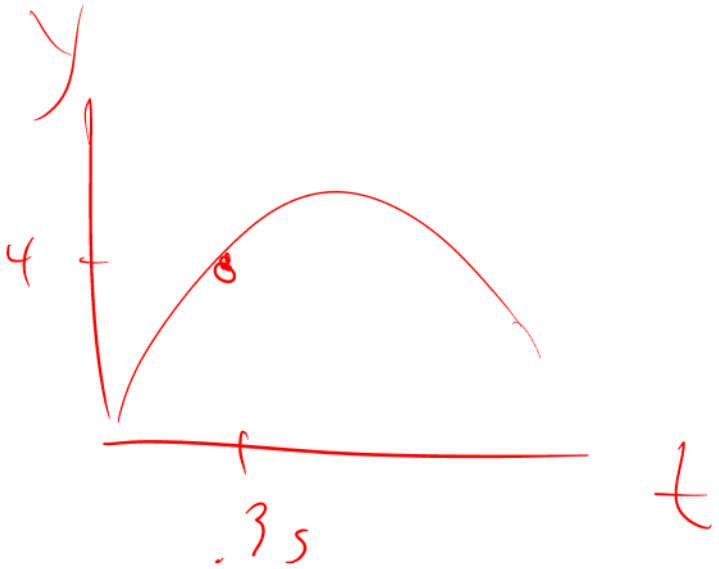
→ you don't need to know "sig figs"

Chapter 2: Kinematics

mathematical description of motion

Recording motion: Choose an origin (zero)
Choose a + direction.





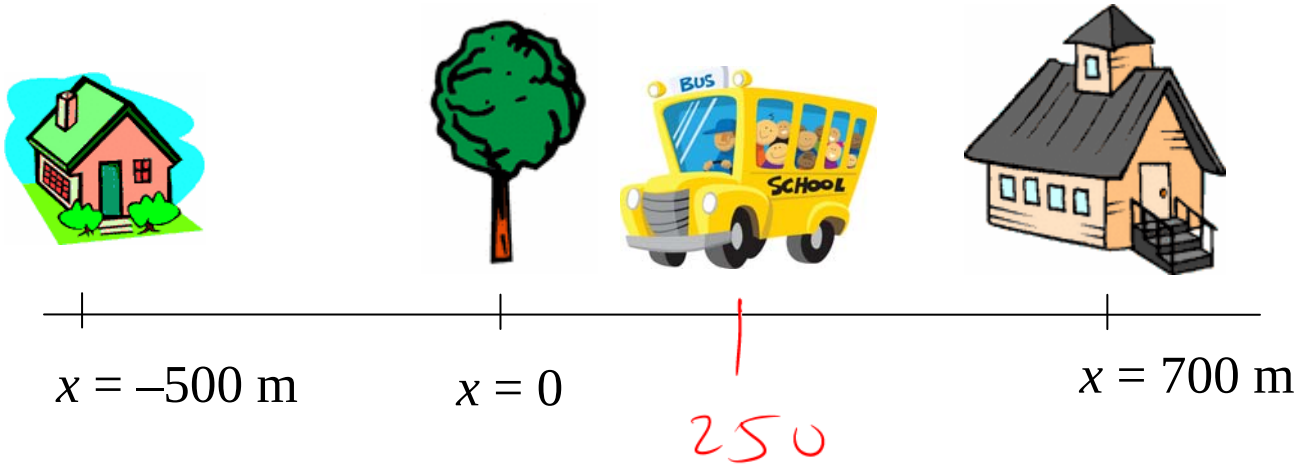
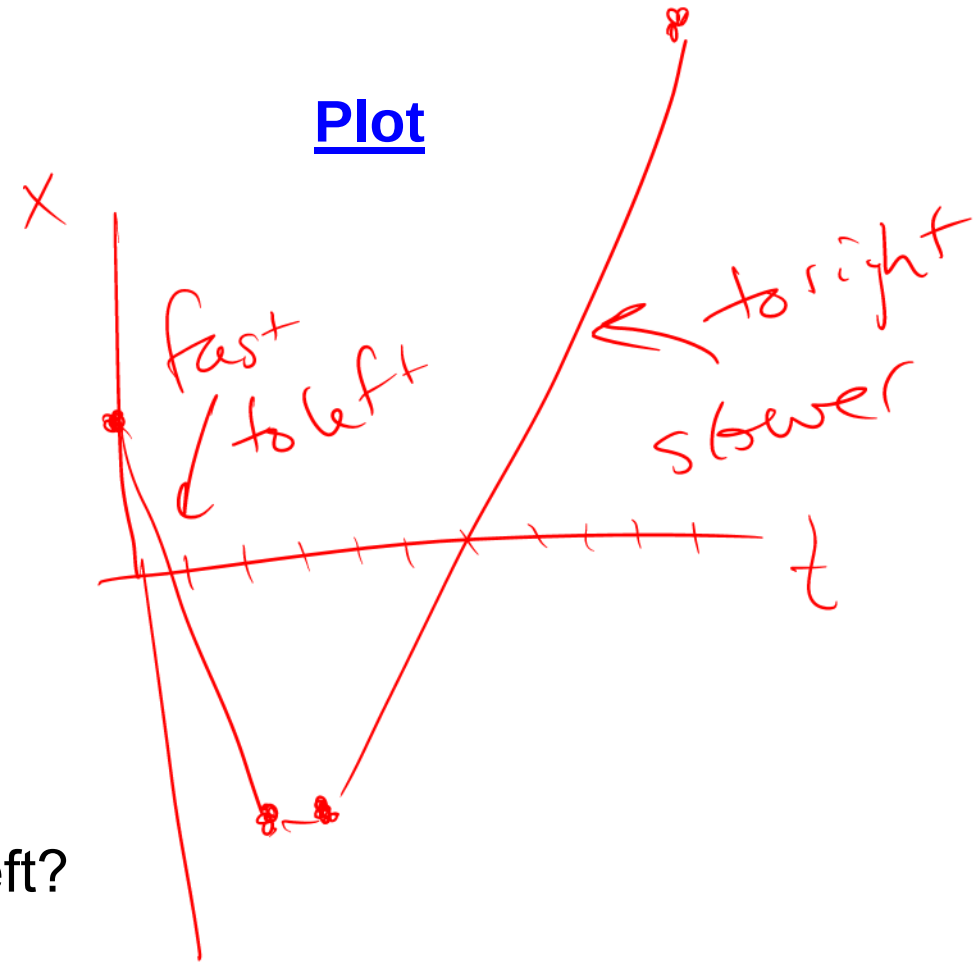


Table: Bus's position

t (min)	*x* (m)
0	250
2	–500
3	–500
10	700

Plot

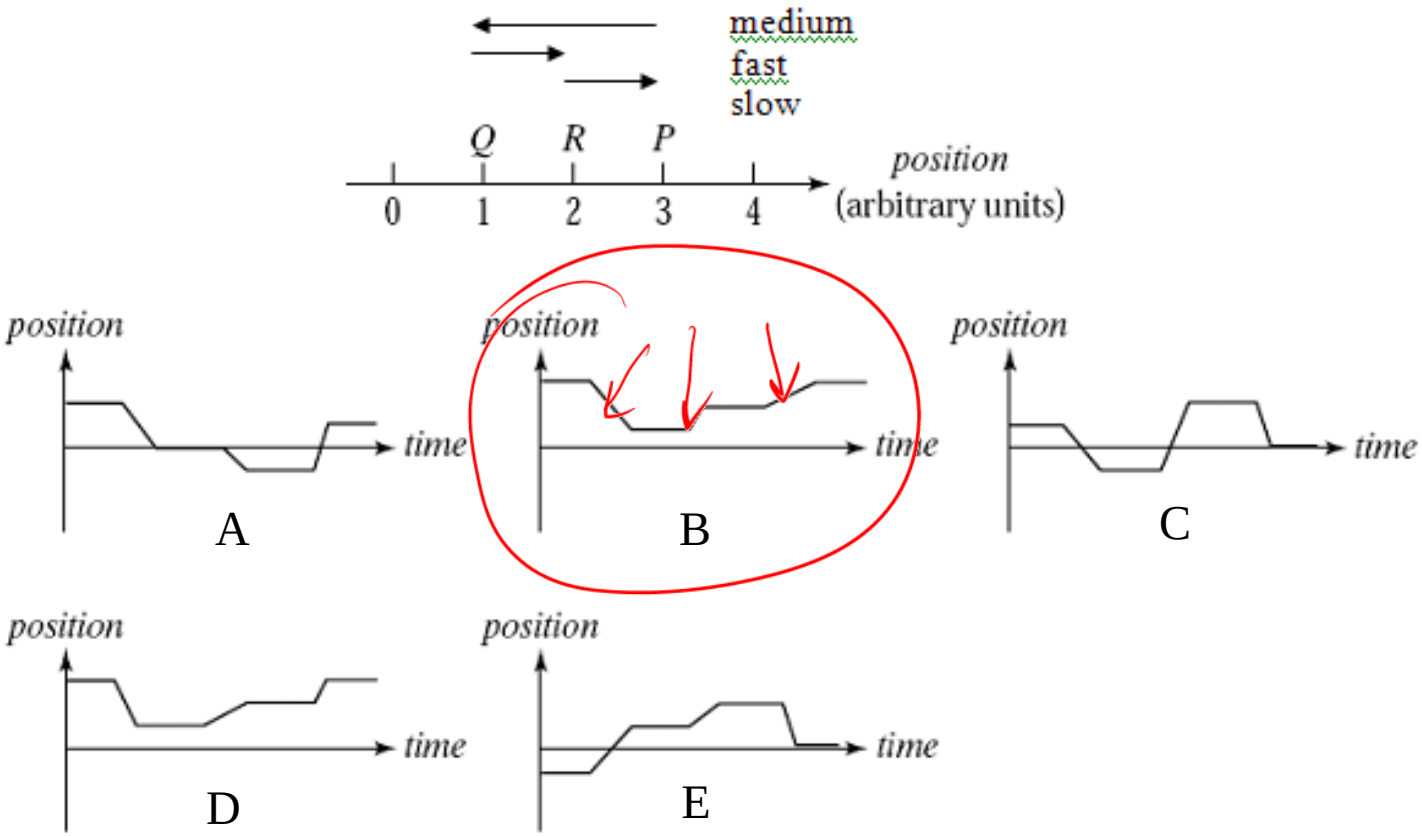


What is the bus doing?

Where is it going the fastest? Slowest?
When is it moving to the right? To the left?

Clicker quiz:

Nancy, initially at point *P* in the illustration, stays there a moment and then moves along the axis to *Q* and stays there a moment. She then runs quickly to *R*, stays there a moment, and then strolls slowly back to *P*. Which of the *x*(*t*) graphs below correctly represents this motion?



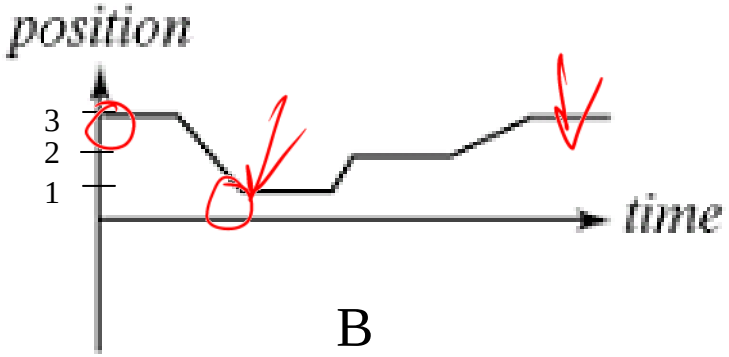
Position vs. Displacement

From warmup: What's the difference between position and displacement?

"Pair share" – Find out your neighbor's answer, be prepared to share it with the class (volunteer if you think it's particularly good).

Clicker: I am now ready to share my neighbor's answer if called on.

a. Yes



Question: what was Nancy's total change in position?

Question: what was Nancy's total <u>displacement</u>?

Position: where something is located, often labeled by ***x***

Displacement: a change in position, often labeled by Δx

$$\Delta x = x_f - x_0$$

f = "final" 0 = initial, pronounced "naught"
also sometimes written as x_i

What do we mean by +/- position?

Being on the right/left side of the *origin*

What do we mean by +/- displacement?

Has *shifted* to the right or left

Velocity

velocity: rate of change of position

displacement

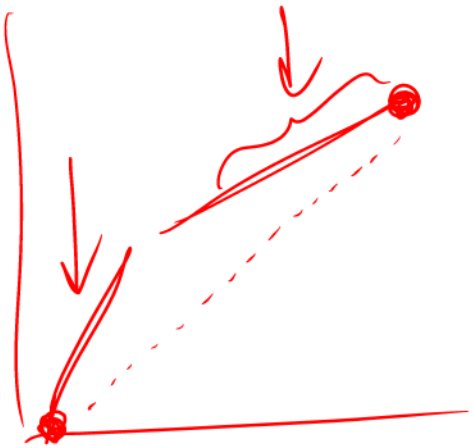
average velocity, v_{ave} =

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

sometimes written <*v*>

→ must always specify the time interval (start/end times)

Slope



Speed vs. Velocity

Speed vs **velocity**: are they the same thing?

From warmup: Give an example where your average velocity could be zero, but your instantaneous velocity could be non-zero.

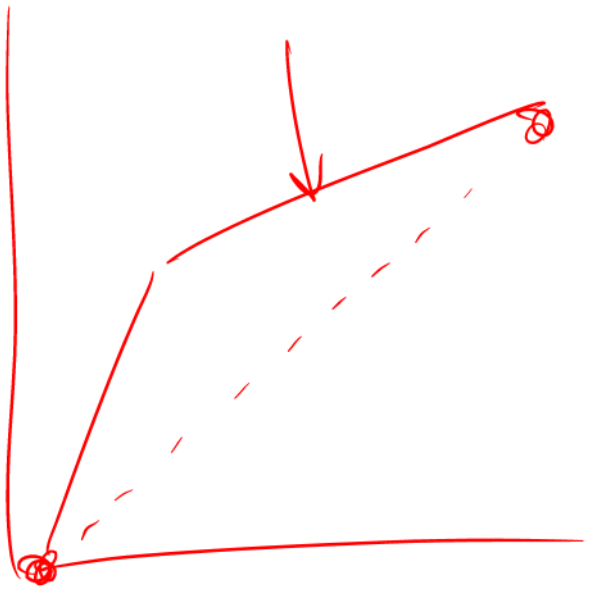
"Pair share"–I am now ready to share my neighbor's answer if called on.

a. Yes

From warmup: Give an example where your average velocity could be non-zero, but your instantaneous velocity could be zero.

"Pair share"–I am now ready to share my neighbor's answer if called on.

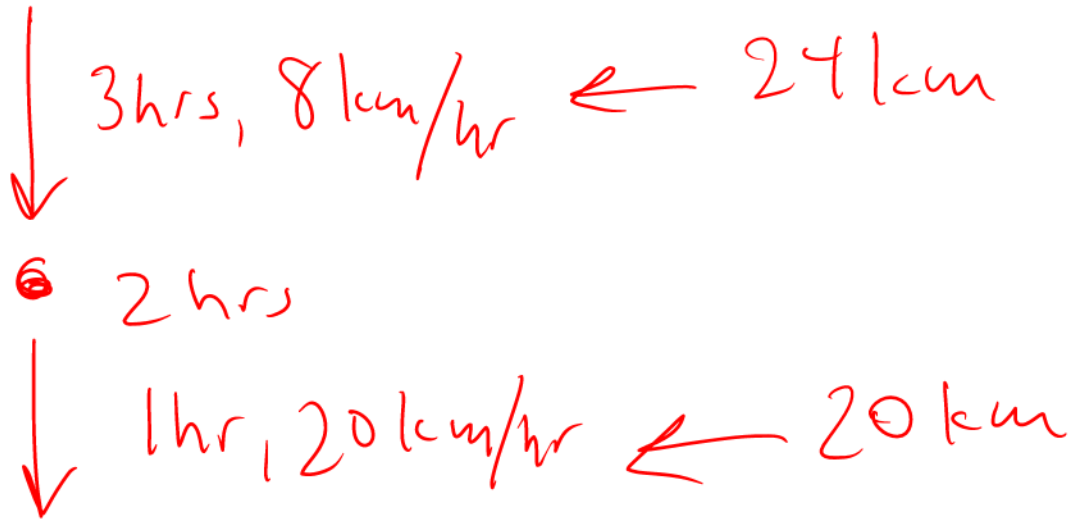
a. Yes



Problem: On the Tour de Provo, bicyclists ride straight south for 3 hours at 8 km/hr, rest for 2 hours, then continue their ride south down a mountain for 1 hour at 20 km/hr. What is their average velocity for the day?

From "Problem Solving" section of syllabus: PEANuT

Picture
Equations
Algebra
Numbers
Think

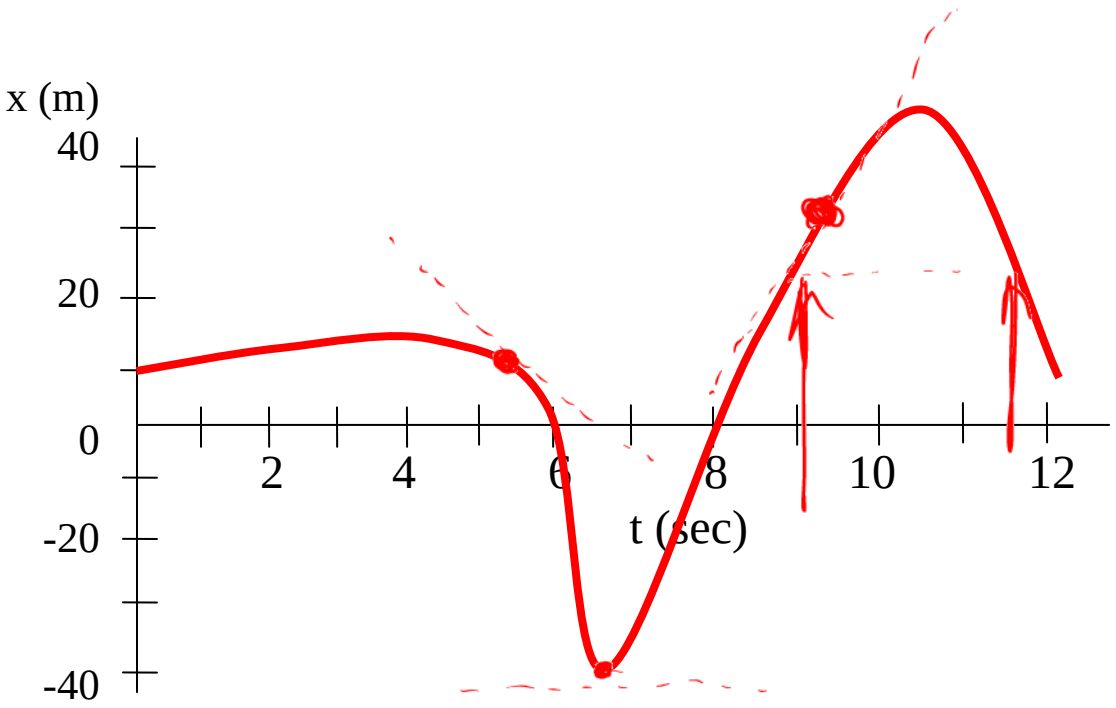


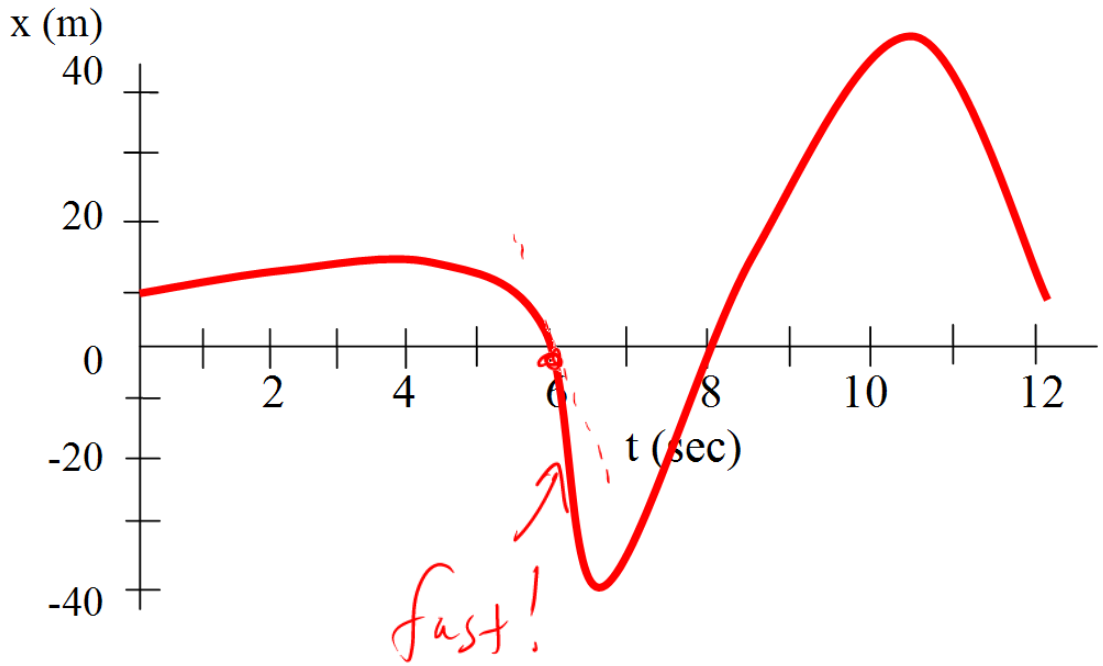
$$v = \frac{\Delta x}{\Delta t} = \frac{44\,km}{6\,hrs} = 7\frac{1}{3}\ km/hr$$

Instantaneous Velocity (…at a particular time)

The instantaneous velocity at a particular time is the average velocity over a very small time interval around that time

= slope of tangent line of the $x(t)$ graph at that point





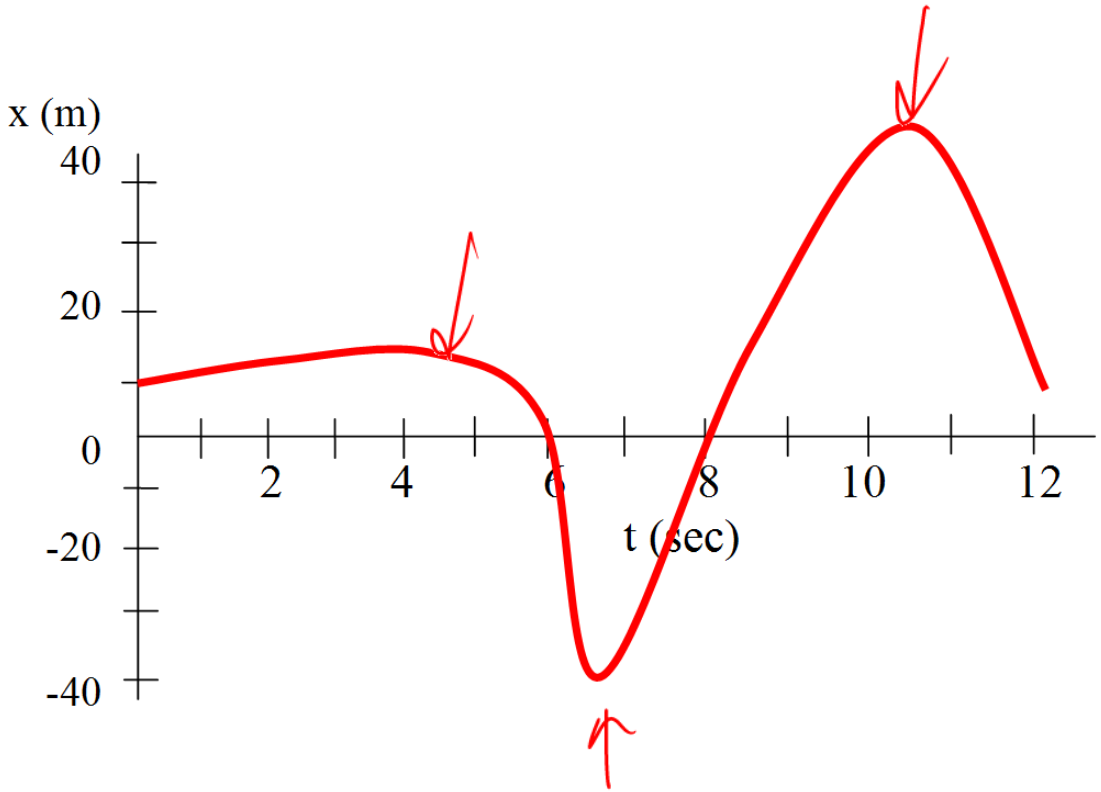
Positive slope means: to the right

Negative slope means: to the left

Zero slope means: turning around/stopped

What is v_x at t = 6 s? (magnitude? direction?)

Where is its fastest speed?



Clicker quiz: During its path, the object stops and turns around _____ times.

a. 1
b. 2
c. 3
d. 4
e. 5

Summary: What you need to do ASAP

Should be already done

- Get/download syllabus packet; read the syllabus
- Get textbook
- Get clicker

Before class on Thursday (due 15 mins before class)

- Do reading assignment (given on Max at start of warmup exercise)
- Do warm-up exercise on Max

Before Thursday 11:59 pm

- Do first homework assignment on Max, resubmit if necessary

Reasonably soon

- Get your CID on Max, for use when turning in any hardcopies
- Register clicker on Max

Optional, but highly recommended

- Form a study group