Announcements – 2 Sep 2014

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

2. Opening prayer
   o Prayer sign-up list

3. I send out periodic class-wide emails. Make sure your myBYU email address is current.

4. Answers to two common questions:
   o The Physics 107 Lab is completely separate from this course, since not all of you need to take it. I know very little about it.
   o I'm not using Learning Suite. We have our own class website instead.

5. TA: Jerika McKeon

Introductory Stuff

Class website

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

Class discussion forum

Max
- CID
- Register clicker
- Calendar

- Warmup quizzes (due 15 mins before class, graded on participation only)
- 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 <u>late</u> 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
- Advice for struggling students
- List of important equations & concepts
- Forms for you to use to turn in FBDs

Read about them on your own!

Pause for questions…

…and now, for the Physics

Chapter 1: Units/Trigonometry

→ skipped, but you <u>do</u> need to know
- how to convert units
- how to do basic Trig

→ you <u>don't</u> need to know "sig figs"

Chapter 2: Kinematics

mathematical description of motion

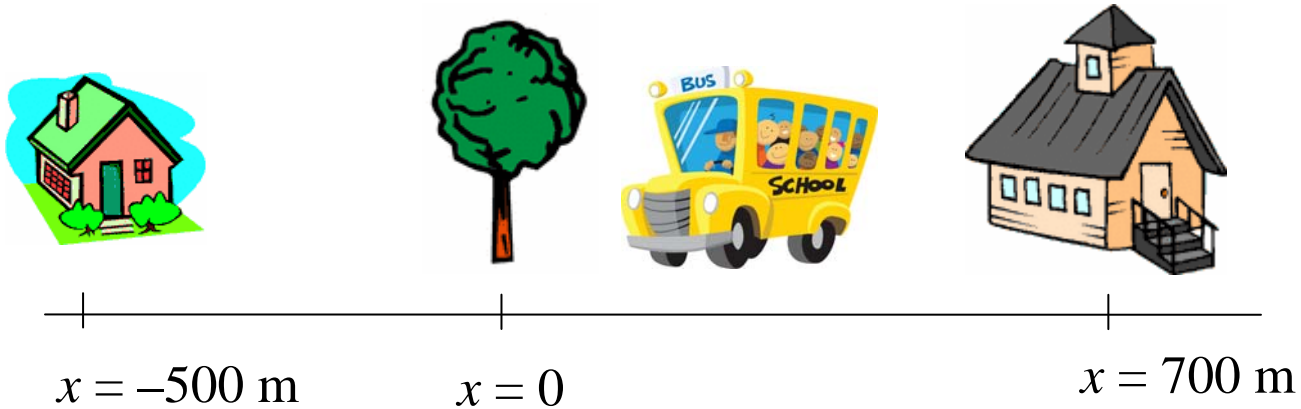Recording motion:　　Choose an origin (zero)

　　　　　　　　　　　Choose a + direction.

$x = -500$ m $x = 0$ $x = 700$ m

Table: Bus's position   Plot

| t (min)	x (m)
0	250
2	−500
3	−500
10	700

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?
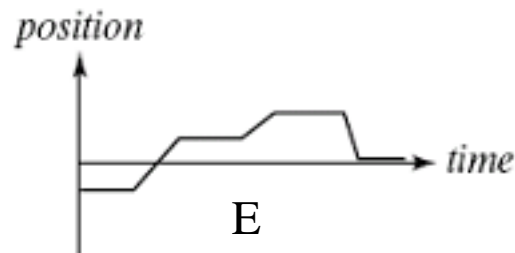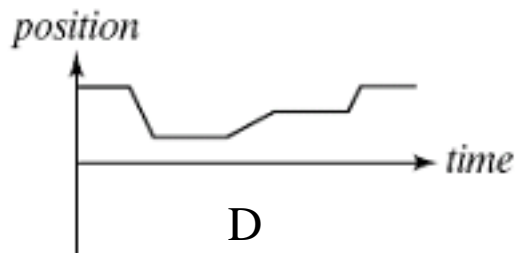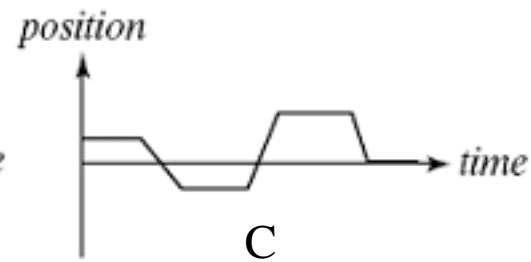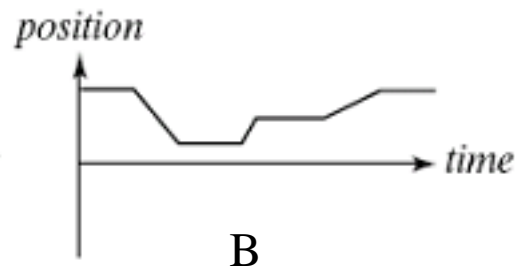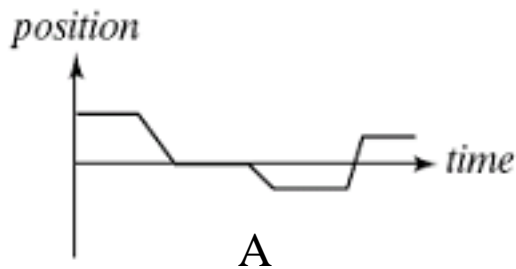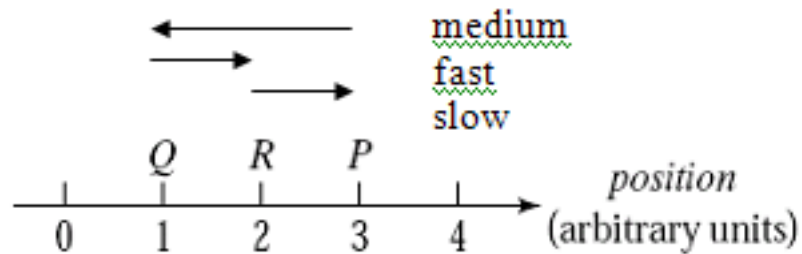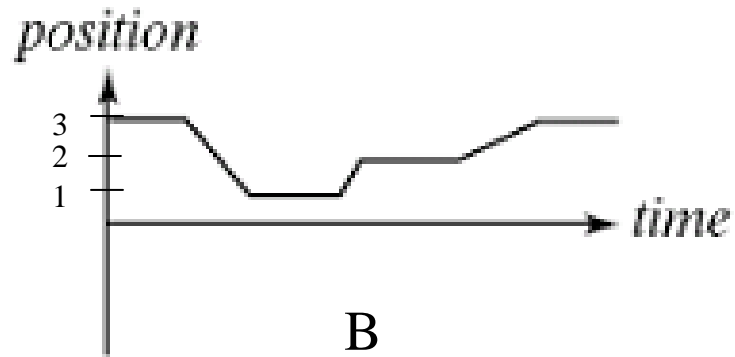
Position vs. Displacement

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

"Think-pair-share"
- Think about it for a bit
- Talk to your neighbor, find out if he/she thinks the same as you
- Be prepared to share your answer with the class if called on

Clicker: I am now ready to share my answer if randomly selected.
   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 Δ*x*

$$\Delta x = x_f - x_0$$

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

average velocity, v_{ave} =

    sometimes written $\overline{v}$ ("v bar")

    $\rightarrow$ 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.

"Think-pair-share"–I am now ready to share my answer if randomly selected.

    a. Yes

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

"Think-pair-share"–I am now ready to share my answer if randomly selected.

    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
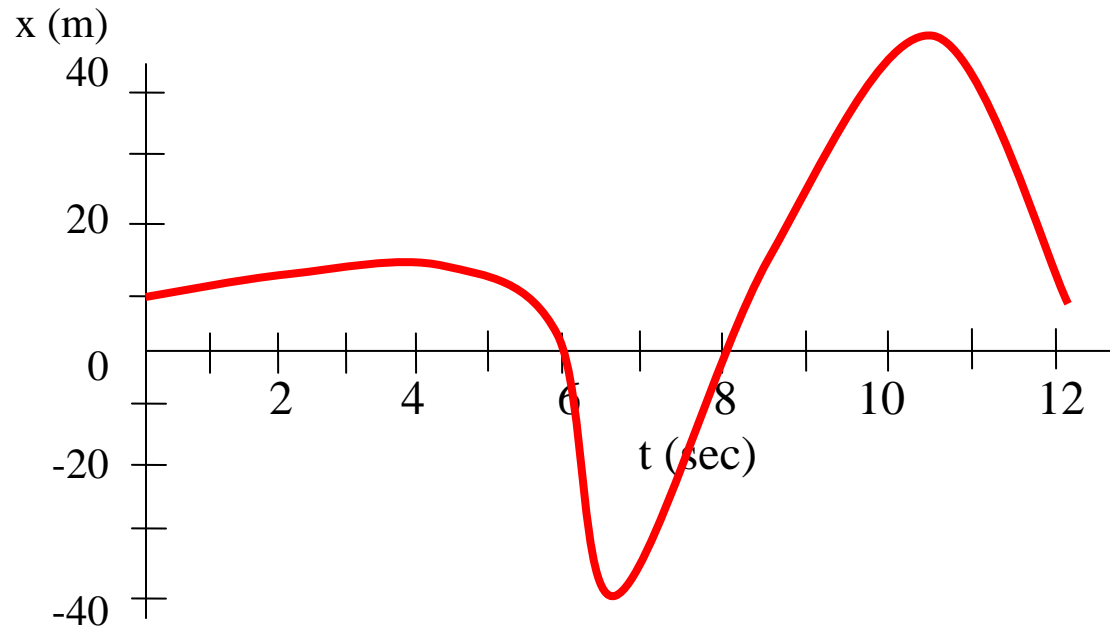   **Think**

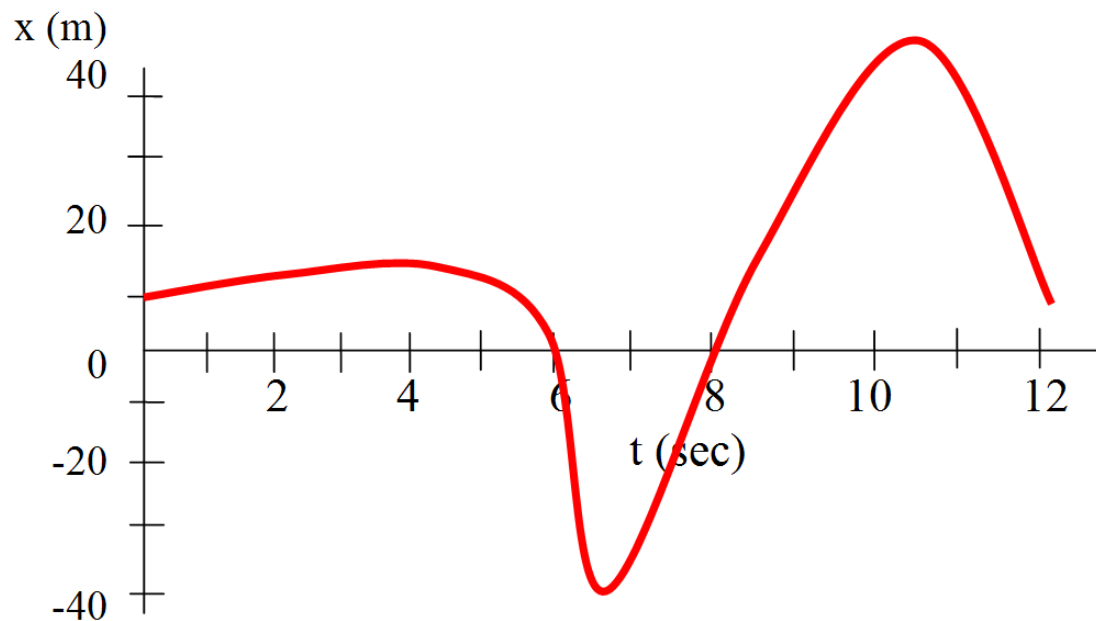# Instantaneous Velocity　　　(…at a particular time)

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

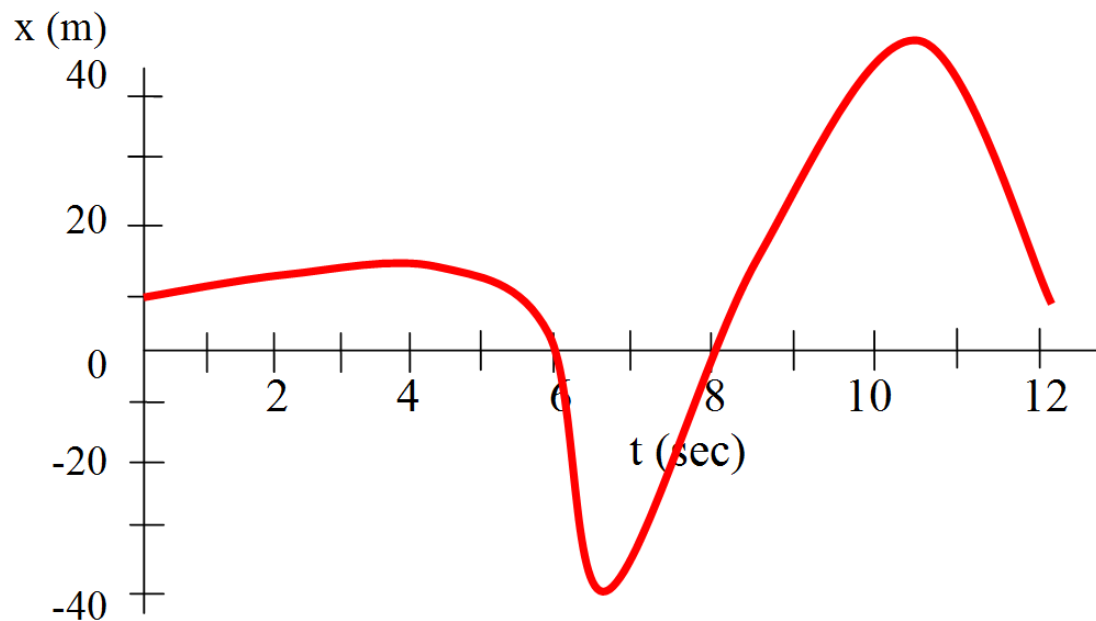　　　= slope of tangent line of the *x*(*t*) graph at that point

Positive slope means:

Negative slope means:

Zero slope means:

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.

      b. 1

      c. 2

      d. 3

      e. 4

      f. 5

Summary: What you need to do ASAP

Should be already done
- Get/download syllabus packet; read the syllabus
- Get textbook & clicker
- Do today's reading assignment

Before Wednesday 11:59 pm
- Do first homework assignment on Max (short)

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

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, use the discussion forum to find people if needed