

Math 1210-02 Homework

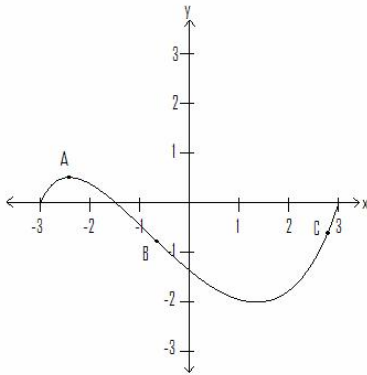
Date	Probable Lecture Topic	Assignments Due
Jan 22	3.1	Hw 7, Hw 8 Due by 4:30 pm sharp
Jan 23	3.2	
Jan 24	3.3	Hw 9 Due at the end of class
Jan 25	Help Session (optional)	
Jan 28	3.3, Review	Hw 10, Hw 11 Due by 4:30 pm sharp
Jan 29	Review	Hw 12 Due at the end of class
Jan 30	Test on Chapter 2 and 3.1-3.3	Extra credit review (optional) due at the beginning of the test
Jan 31	3.4	
Feb 1	Help Session (optional)	

Resources for Help:

- The Student Success Center <http://www.suu.edu/ss/success/> in the Sharwan Smith Center has free tutoring <http://www.suu.edu/ss/success/tutoring.html>.
- My office hours are Monday and Thursday, 10-12, 4-4:30 in SC 120. Other times by appointment.
- Friday help sessions with the TA are primarily question/answer sessions.

Hw 9: (due Thurs Jan 24 at the end of class)

A. Draw the tangent line to the graph shown at C. Draw the secant line through A and B.



B. Fill in the blanks: Slope represents the rate that _____ is changing with respect to _____.

C. Give a formula for average rate of change.

D. Fill in the blanks: The average rate of change is the slope of the _____ while the instantaneous rate of change is the slope of the _____.

E. What is velocity? Give the definition, not how to find it.

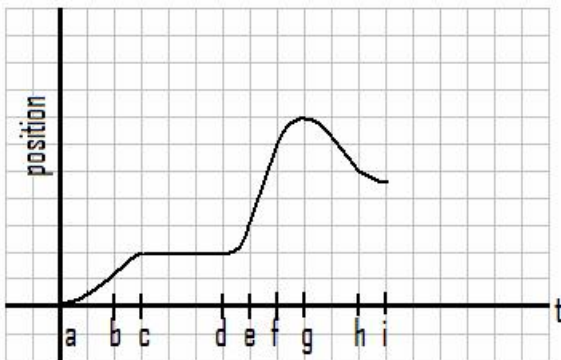
F. Depending on the context, t often represents _____ and s represents _____.

G. Give three examples of real-life rates of change.

H. pg 175: 3

I. pg 176: 1,4,5,7

J. Farmer Bob is driving his '76 Chevy Luv from his house to his neighbor's barn. Below is a graph of the position of Bob vs time. Give time(s) or interval(s) of time that best fit the situations below.



- i. Bob stops to let a cow and her calf cross the road.
- ii. Bob does a U-turn because he went too far.
- iii. Bob is going the fastest.

K. When is the average rate of change the same as the instantaneous rate of change?

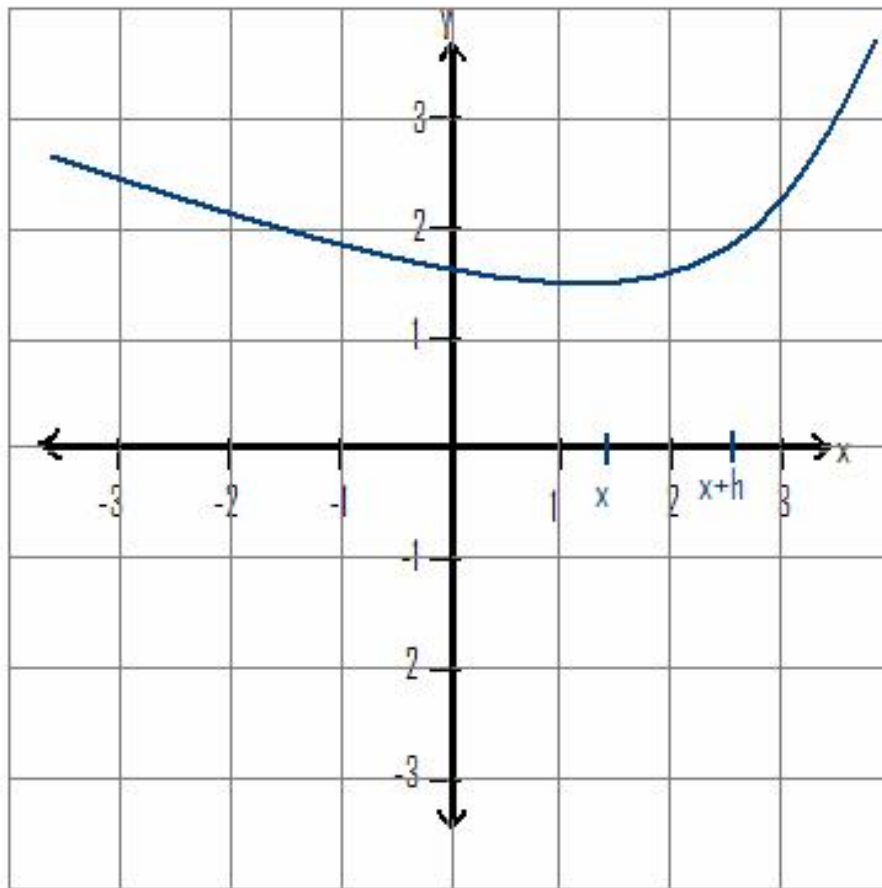
pg 177-178: 19,20a

L. After an advertising campaign, sales of *The Irrational Book of Math Jokes* first increased, then decreased according to the model $S(t) = -40t^2 + 300t + 4500$ where $S(t)$ is the number of books sold t weeks after the start of the ad campaign. What is the average change of sales during the third week, i.e. from $t = 2$ to $t = 3$? Be sure to label the units.

Hw 10: (due Mon Jan 28 by 4:30pm sharp)

A. Label/draw the following on the graph below.

- $f(x)$
- $f(x+h)$
- $(x, f(x))$
- $(x+h, f(x+h))$
- the secant line between the above two ordered pairs
- give the slope of the above secant line
- the line segment of length h
- the line segment of length $f(x+h) - f(x)$



B. What does the derivative of a function have to do with its graph?

C. Give two notations commonly used for the derivative.

Quick Check Exercise pg 187: 1a,3

Exercises pg 187-189: 2,3ab,5,8,9,13,16,22-24,25,28a,34a,35

D. Find $\lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$ for $f(x) = 2x - 7$. Give the value of the limit when $x = 3$ and interpret your answer.

E. What does it mean for a function to be differentiable at a point?

F. True or false? If a function is differentiable, then it is continuous.

G. Draw the graph of a function that is continuous but not differentiable.

pg 189: 43,44

Hw 11: (due Mon Jan 28 by 4:30pm sharp)

A. What is another way of writing $x^{1/2}$? x^{-3} ? $\frac{1}{x^{-2}}$? $\frac{1}{\sqrt[5]{x}}$? $x^{4/3}$?

B. Give the power rule from memory.

C. When is the derivative of a function constant?

D. Explain why the derivative of a constant is 0.

E. Find the derivatives of the following:

a. $y = 1$

b. $y = x$

c. $y = x^2$

d. $y = x^3$

e. $y = x^4$

f. $y = \frac{1}{x}$

g. $y = \frac{1}{x^2}$

h. $y = \frac{1}{x^3}$

i. $y = \frac{1}{x^4}$

j. $y = \sqrt{x}$

k. $y = \frac{1}{\sqrt{x}}$

F. When taking a derivative, what does one do with constant multiples?

G. When taking a derivative, what does one do with sums?

H. Find the derivatives of the following:

a. $y = kx$

b. $y = x + k$

c. $y = x^k$

Exercises pg 196: 1,3-5,8,9,15,19,24,30,33,45,48,60,61,65a

pg 178: 21d

I. What is the binomial theorem?

J. Read the proof on pg 191 of the power rule. Try to understand the details. Put a check \checkmark to show you did it.

Hw 12: (due Tues Jan 29 by the end of class)

A. What is the second derivative of a function?

pg 197: 37a,39,40a,41b,44

B. Give three common notations for the 2nd derivative.

C. Give two common notations for the 2nd derivative evaluated at a particular point.

D. Find the sixth derivative of $y = x^6$. What do you notice about the exponent? What do you notice about the coefficient?

E. Using the definition of the derivative, prove that $\frac{d}{dx}[f(x) - g(x)] = \frac{d}{dx}[f(x)] - \frac{d}{dx}[g(x)]$.