

Classwork 4

College Algebra and Trigonometry, MTH 123, Section 3260, Fall 2011

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Name: SOLUTIONS

1.

$$f(x) = \begin{cases} 2 - 5x & \text{if } x \geq 5 \\ 4x & \text{if } -3 \leq x < 5 \\ 3 - 2x & \text{if } x < -3 \end{cases}$$

slope
-5 decr
4 incr
-2 decr

Find the intervals on which f is increasing and decreasing. (Hint: you do not need to draw the graph of the function !)

Since each piece is linear, slope determines if f is incr or decr.

Increasing on $[-3, 5]$

Decreasing on $[5, \infty)$ and $(-\infty, -3]$

2. Determine the average rate of change of the function $f(x) = x^3 - 4x^2$ between $x = 2$, $x = 10$.

$$ARC = \frac{f(10) - f(2)}{10 - 2} = \frac{600 - (-8)}{8} = \frac{608}{8} = 76$$

$$f(10) = 10^3 - 4 \times 10^2 = 600$$

$$f(2) = 2^3 - 4 \times 2^2 = 8 - 16 = -8$$

3. The table below shows the number of mp3 player sales in an electronic store in years 2000 - 2010. Find the average rate of change of the sales between 2003 to 2006 and between 2006 to 2010.

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
5120	5200	4130	4100	4680	5100	5900	6070	7320	6120	5840

$$ARC \text{ between 2003 to 2006} = \frac{5900 - 4100}{2006 - 2003} = \frac{1800}{3} = 600$$

$$ARC \text{ between 2006 to 2010} = \frac{5840 - 5900}{2010 - 2006} = \frac{-60}{4} = -15$$