Math 0120 Homework_05 is due : 08/29/2012 at 02:10pm EDT.

Reference: Berresford, Sections 3.1, 3.2

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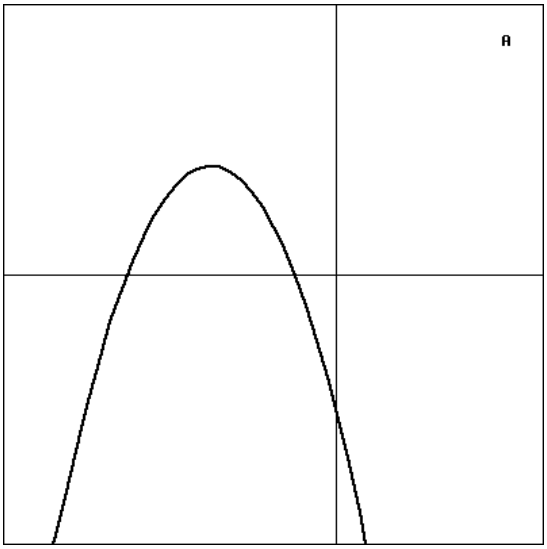
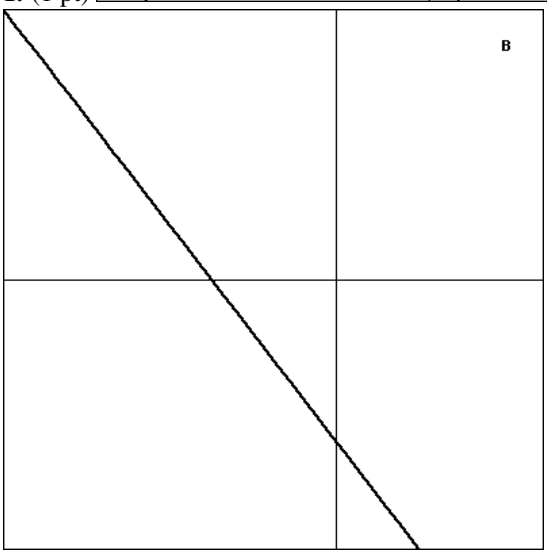
1. (1 pt)





Graphs A and B are approximate graphs of f and f' for $f(x) = -x^2 - 12x - 34$.
So f is decreasing (and f' is negative) on the interval (a, ∞) for $a =$_____.

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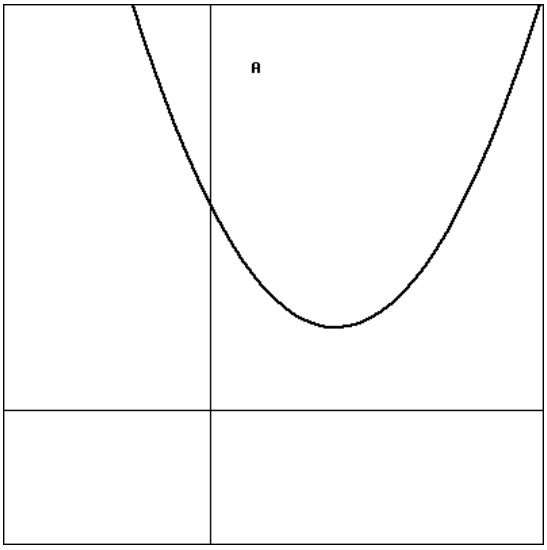
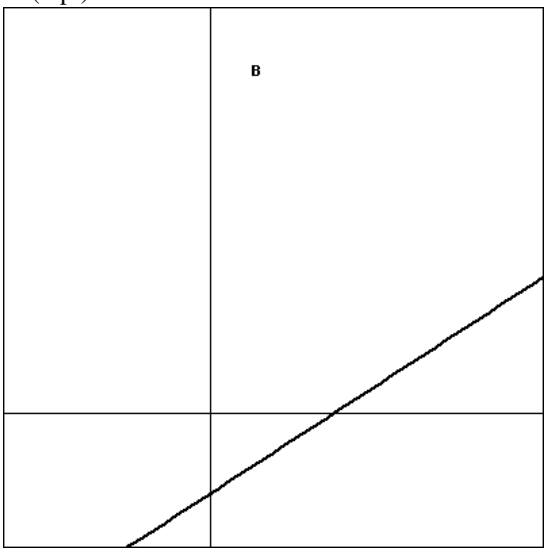
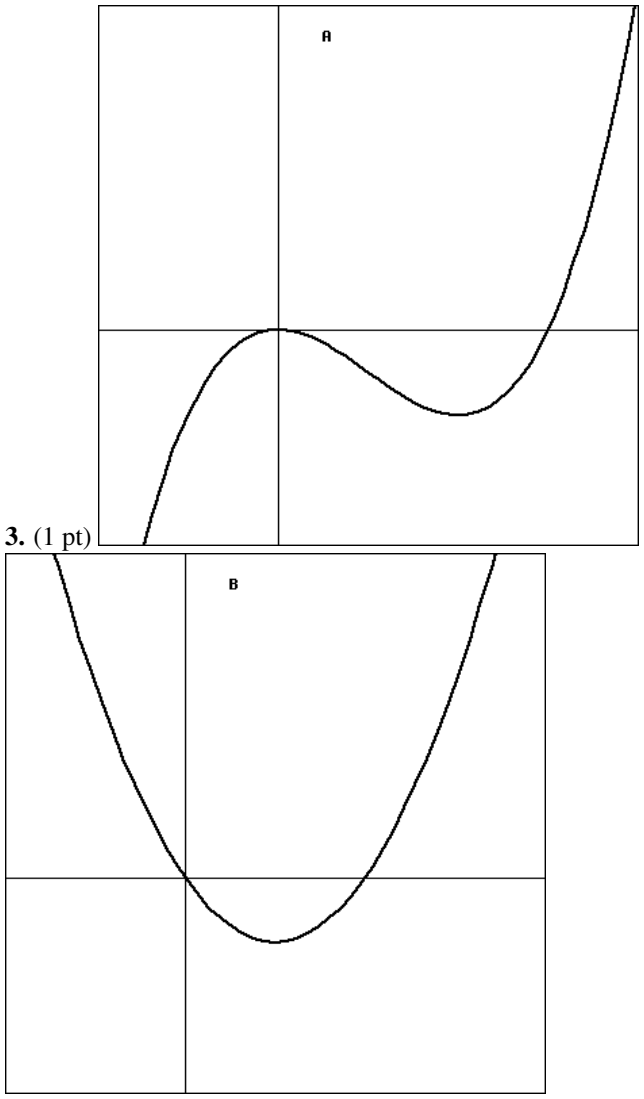
2. (1 pt)





Graphs A and B are approximate graphs of f and f' for $f(x) = x^2 - 2x + 5$.
So f is increasing (and f' is positive) on the interval (a, ∞) for $a =$_____.

3. (1 pt)



Graphs A and B are approximate graphs of f and f' for $f(x) = x^2(x-18)$.
So f is decreasing (and f' is negative) on the interval $(0,a)$ for $a =$_____.

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4. (1 pt) Consider the function $f(x) = -2x^2 + 8x - 4$. $f(x)$ is increasing on the interval $(-\infty, A]$ and decreasing on the interval $[A, \infty)$ where A is the critical number.
Find A _____
At $x = A$, does $f(x)$ have a local min, a local max, or neither? Type in your answer as LMIN, LMAX, or NEITHER. _____

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5. (1 pt) Consider the function $f(x) = -2x^3 + 30x^2 - 126x + 8$. For this function there are three important intervals: $(-\infty, A]$, $[A, B]$, and $[B, \infty)$ where A and B are the critical numbers.
Find A _____
and B _____
For each of the following intervals, tell whether $f(x)$ is increasing (type in INC) or decreasing (type in DEC).
$(-\infty, A]$: _____
$[A, B]$: _____
$[B, \infty)$: _____

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6. (1 pt) Consider the function $f(x) = 8x + 6x^{-1}$. For this function there are four important intervals: $(-\infty, A]$, $[A, B)$,(B, C), and $[C, \infty)$ where A, and C are the critical numbers and the function is not defined at B.
Find A _____
and B _____
and C _____
For each of the following intervals, tell whether $f(x)$ is increasing (type in INC) or decreasing (type in DEC).
$(-\infty, A]$: _____
$[A, B)$: _____
$(B, C]$: _____
$[C, \infty)$: _____

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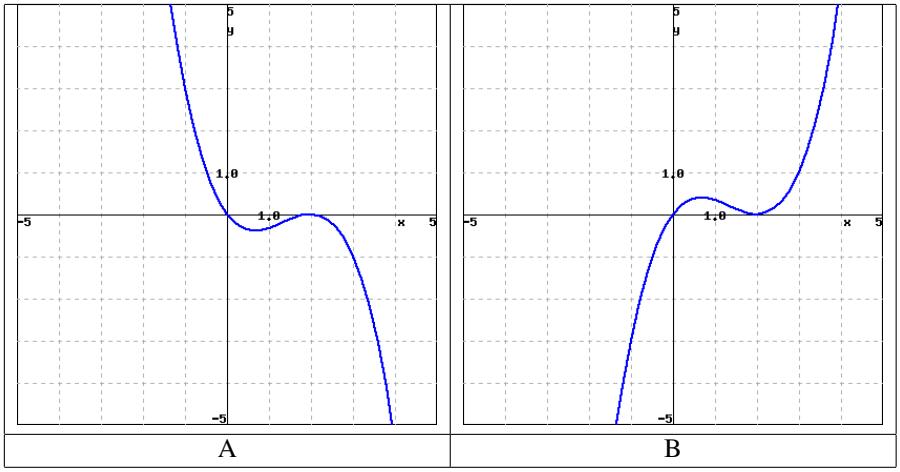
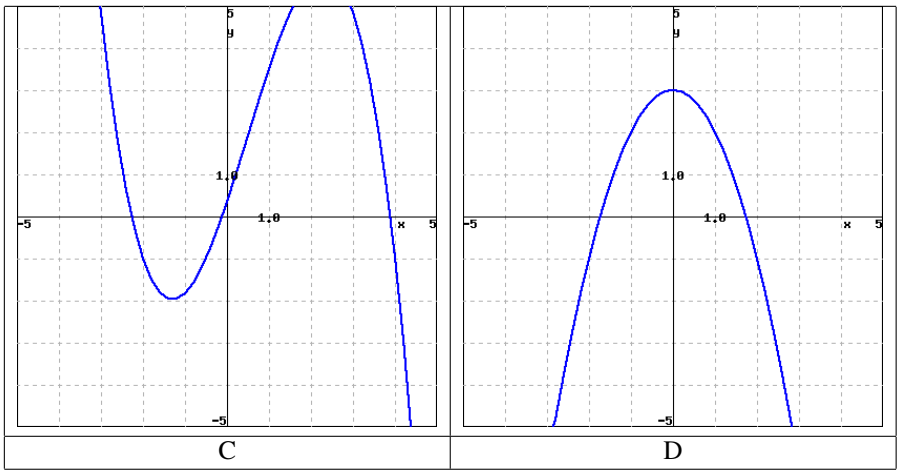
7. (1 pt)

Use properties of functions to match each of the following functions with its graph. *Do not use your calculator.* Clicking on a graph will give you an enlarged view.

[?] 1. $f(x) = -x(2-x)^2/3$
[?] 2. $f(x) = x(2-x)^2/3$
[?] 3. $f(x) = -x^3/3 + x^2/2 + 3x + 1/3$
[?] 4. $f(x) = -x^2 + 3$





8. (1 pt) Find all critical numbers for the function

$$f(x) = 1x^3 + 0x^2 + (-12)x + (-9).$$

Give your answer as a comma separated list of numbers. If there are no critical numbers, enter NONE.
Answer: _____

Classify each of the critical numbers you found above as a relative minimum (MIN), relative maximum (MAX), or neither (NEITHER). Again, give your answer as a comma separated list, in the same order that you listed the critical points above.
Answer: _____

9. (1 pt) Find all critical numbers for the function

$$f(x) = -\frac{x^{1/3}}{x^2+7} + 10.$$

Give your answer as a comma separated list of numbers. If there are no critical numbers, enter NONE.
Answer: _____

Classify each of the critical numbers you found above as a relative minimum (MIN), relative maximum (MAX), or neither (NEITHER). Again, give your answer as a comma separated list, in the same order that you listed the critical points above.
Answer: _____

List all numbers a such that the line $x = a$ is an asymptote for the graph of f. Give your answer as a comma separated list of numbers. If the graph has no vertical asymptotes, enter NONE.
Answer: _____

List all numbers b such that the line $y = b$ is an asymptote for the graph of f. If the graph has no horizontal asymptotes, enter NONE.
Answer: _____