

Version 1

Math 151:4,5,6

Additional points for your second exam grade

11/30/2006

Name _____

Section _____

NO CALCULATORS OR NOTES ARE ALLOWED.

1. Suppose $f(x) = x(x - 2)^3$.

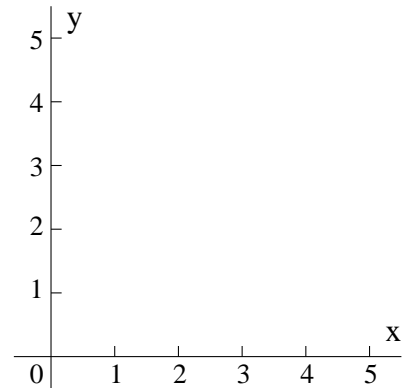
a) (2 points) The derivative of f , $f'(x)$, is _____.

b) (2 points) The second derivative of f , $f''(x)$, is _____.

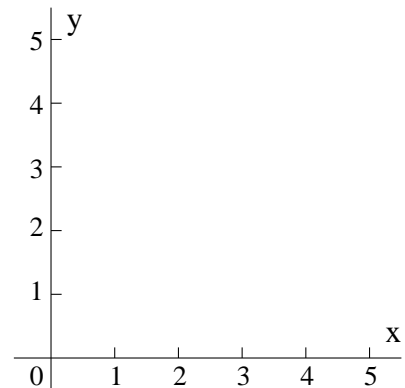
c) (2 points) The second derivative of f is 0 at $x =$ _____ and $x =$ _____.

2. In this problem, f is a differentiable function and $f'(x) = 0$ only at $x = 2$ and $x = 4$.

a) (3 points) Use the axes to the right to draw a graph of f on the interval $[1, 5]$ where the maximum value of f on that interval occurs at $x = 1$ and the minimum value of f on that interval occurs at $x = 5$. Also $f(1) = 4$ and $f(5) = 1$.



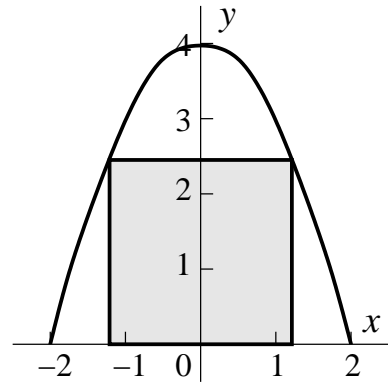
b) (3 points) Use the axes to the right to draw a graph of f on the interval $[1, 5]$ where the maximum value of f on that interval occurs at $x = 2$ and the minimum value of f on that interval occurs at $x = 4$. Also $f(2) = 4$ and $f(4) = 1$.



3. (3 points) If $f(1) = 3$ and $f'(1) = 7$, then $f(.96)$ is approximately _____.
(Do *not* simplify your numerical answer!)

OVER

4. (8 points) Find the area of the rectangle of largest area which has one side on the x -axis and is “under” the graph $y = 4 - x^2$, as shown to the right. (Do *not* simplify your numerical answer!)



The area of the rectangle of largest area is _____.

5. (7 points) The following is known about $f(x)$:

• $f''(x) = 5x + 3 \cos x$ • $f'(0) = 7$ • $f(\pi) = -2$

Find $f(x)$. Do not attempt to “simplify” your answer, except that you must find explicit values of any trig functions.

$f(x) =$ _____