

MTH 162
Quiz 10
Spring 2011

Show all work in a neat and organized fashion. Clearly indicate your answers.
10 points possible.

function	derivative
$y = fg$	$y' = f'g + fg'$
$y = \frac{f}{g}$	$y' = \frac{f'g - fg'}{g^2}$
$y = (\text{stuff})^n$	$y' = n(\text{stuff})^{n-1}(\text{stuff})'$

1. (3 pts.) Find the derivative of the given function. Do not simplify your answer.

$$h(x) = \frac{10}{(4x^3 + 2x)^5}$$

2. (7 pts.) Let

$$f(x) = 2x^3 - \frac{31}{2}x^2 + 5x.$$

Use the derivative and/or the second derivative, showing all work, to do the following.

(a) Find $f'(x)$ and $f''(x)$.

(b) Find the critical values of f .

(c) Find the critical points of f .

2. (Continued)

(d) Find the intervals on which f is increasing and those on which f is decreasing.

(e) Find the x -coordinates of all relative maxima and all relative minima of f .

2. (Continued)

(f) Find the intervals on which f is concave upward and those on which f is concave downward.

(g) Find the x -coordinates of all points of inflection of f .

2. (Continued)

(h) Sketch the graph of $y = f(x)$.