

Math 122
Spring 2011
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Applied Calculus II
Quiz 2
Write your name on this quiz

Solution

1. Compute the following derivatives. Do not simplify the answers.

$$(a) \frac{d}{dx} ((3x+1)^8) = 8(3x+1)^7 \cdot 3$$

$$(b) \frac{d}{dx} (e^{17x-x^2}) = (e^{17x-x^2}) \cdot (17-2x)$$

$$(c) \frac{d}{dz} \left(\frac{z^2+1}{z-1} \right) = \frac{2z(z-1) - (z^2+1) \cdot 1}{(z-1)^2}$$

(turn this page over)

2. Find the absolute maximum and minimum values attained by the function $f(x) = x^3 - 6x^2 + 9x - 8$ on the interval $[0, 5]$. (For your information, $f(5) = 12$).

$$f(x) = x^3 - 6x^2 + 9x - 8$$

$$f'(x) = 3x^2 - 12x + 9$$

Find x values that make $f' = 0$ or undefined:

$$f'(x) = 0 \rightsquigarrow 3x^2 - 12x + 9 = 0$$

↓

$$3(x-1)(x-3) = 0$$

so we have to check the values of $f(x)$

when $x = 1$, $x = 3$ and $x = 0, x = 5$
} endpoints of $[0, 5]$

$$f(0) = -8$$

$$f(1) = -4$$

$$f(3) = -8$$

$$f(5) = 12$$

So, -8 is the minimum value at $x = 0, 3$

& 12 is the maximum value at $x = 5$