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Prepa Tec – Campus Cumbres
Calculus I 2nd partial
Quiz # 2

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I. Determine whether each of the following statements is true or false (5 points each)

1. F The derivative of $y = 6 - e^{-x}$ is $y' = -e^{-x}$ $-e^{-x} = e^{-x}$

X 2. T The derivative of $y = Ln(x-4)^{3/2}$ is $y = \frac{3}{2}Ln(x-4)^{1/2}$ $\frac{1}{(x-4)^{3/2}}\left(\frac{3}{2}(x-4)^{1/2}\right) = \frac{\frac{3}{2}(x-4)^{1/2}}{(x-4)^{3/2}} = \frac{3}{2}(x-4)^{-1/2}$ $\frac{3}{2}m(x-4)$

3. F If $s(t)$ is the function of position of an object in motion, then the derivative of s(t) is the acceleration of the object. $v(t)$

X 4. T If f(1)=0 then it is always true that f'(1)=0.

II. Circle the right answer. (10 point each)

1. (C) The derivative for $y = 2e^{3/x}$ is:

A) $y' = 2e^{3/x}$ B) $y' = 2e^3$ C) $y' = -\frac{6e^{3/x}}{x^2}$ D) $y' = 6x^2e^{3/x}$

$y = 2e^{3x^{-1}}$
$y' = -6x^{-2}e^{3x^{-1}}$
$y' = -\frac{6e^{3/x}}{x^2}$

2. (A) The derivative for $y = Ln\sqrt{2x-4}$ is:

A) $y' = \frac{1}{2x-4}$ B) $y' = \frac{1}{2}Ln(2x-4)^{-1/2}$

C) $y' = \frac{1}{2}Ln\frac{2}{\sqrt{2x-4}}$ D) $y' = \frac{1}{x-2}$

$y' = ln(2x-4)^{1/2}$
$y' = \frac{1}{(2x-4)^{1/2}} \cdot (2x-4)^{-1/2}$
$y' = \frac{(2x-4)^{-1/2}}{(2x-4)^{1/2}}$
$y' = (2x-4)^{-1}$
$y' = \frac{1}{2x-4}$

3. (A) If the equation that gives the velocity of an object is $v(t) = 2t^3e^{6t}$, then the equation that gives the acceleration is:

$u' = 6t^2$ $v' = 6e^{6t}$

A) $a(t) = 6t^2e^{6t}(2t+1)$ B) $a(t) = 6t^2e^{6t}$
C) $a(t) = 36t^2e^{6t}$ D) $a(t) = 12t^3e^{6t}$

$a(t)' = (e^{6t})(6t^2) + (2t^3)(6e^{6t})$
$a(t)' = 6t^2e^{6t} + 12t^3e^{6t}$
$a(t)' = 6t^2e^{6t}(1+2t)$

III. Answer the following questions.

1) Find the SLOPE of the line tangent to $y = \frac{e^{3-2x}}{6}$ at $x = 3/2$ (20 points)

$u = e^{3-2x}$ $\quad v = 1/6$

$u' = -2e^{3-2x}$ $\quad v' = 0$

$f'(x) = \left(\frac{1}{6}\right)(-2e^{3-2x}) + (e^{3-2x})(0)$

$f'(x) = \frac{-2}{6}e^{3-2x}$

$f'(x) = \frac{-1}{3}e^{3-2x}$

$m = \frac{-1}{3}$

$f'\left(\frac{3}{2}\right) = \frac{-1}{3}e^{3-2(3/2)}$ $\quad -\frac{2}{1} \cdot \frac{3}{2} = \frac{6}{2} = 3$

$f'\left(\frac{3}{2}\right) = \frac{-1}{3}e^{0}$

$f'\left(\frac{3}{2}\right) = -0.3333$

2) Find the derivative of $f(x) = \frac{(2x-1)^5}{x}$ (15 points)

$u = (2x-1)^5$ $\quad v = x^{-1}$

$u' = 10(2x-1)^4$ $\quad v' = -x^{-2}$

$f'(x) = (x^{-1})(10(2x-1)^4) + (2x-1)^5(-x^{-2})$

$f'(x) = 10x^{-1}(2x-1)^4 - x^{-2}(2x-1)^5$

$f'(x) = x^{-2}(2x-1)^4[10x - (2x-1)]$

$f'(x) = x^{-2}(2x-1)^4[10x - (2x-1)]$

3) Find the derivative $g(x) = 3x^2 + \frac{1}{e^{2x}} + \ln(4x^2+3) + e$ (15 points)

$f'(x) = 1e^{2x^{-1}}$ $\quad u = 1 \quad v = e^{2x}$

$u' = 0 \quad v' = -2x$

$g'(x) = 6x + 1e^{2x^{-1}} + \left(\frac{1}{(4x^2+3)}(8x)\right) + e$

$\frac{1}{e^{2x}} = e^{-2x}$

$y' = -2e^{-2x}$

$f'(x) = (e^{2x^{-1}})(0) + (1)(-2x^{-2}e^{2x^{-1}}$

$f'(x) = -2x^{-2}e^{2x^{-1}}$

$g'(x) = 6x - 2x^{-2}e^{2x^{-1}} + \frac{8x}{4x^2+3} + e$

$f'(x) = (4x^2+3)'$

$f'(x) = 1(4x^2+3)^0 \cdot 8x$

$f'(x) = 8x$

$g'(x) = 6x - \frac{2}{x^2e^{2x}} + \frac{8x}{4x^2+3} + e$

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$g'(x) = 6x - \frac{2}{x^2e^{2x}} + \frac{8x}{4x^2+3} + e$