

$6 - e^{-x}$
 $e^{-x^{1-1}}$
 e

$y = \ln(x-4)^{\frac{3}{2}}$ $u = (x-4)^{\frac{3}{2}}$
 $y' =$ $u' = \frac{3}{2}(x-4)^{-\frac{1}{2}}(1)$
 $u' =$

Prepa Tec
 Calculus I 2nd partial
 Quiz # 2A

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I. Determine if true or false for each of the following statements (5 points each)

- ~~F~~ The derivative of $y = 6 - e^{-x}$ is $y' = e^{-x}$ $y = xe^{-x}$ $u = 3x$ $v = 4x^2 - 5$
 $u' = 3$ $v' = 8x$ $y' = \frac{(4x^2-5)(3) - 3x(8x)}{(4x^2-5)^2}$
- ~~F~~ The derivative of $y = \ln(x-4)^{\frac{3}{2}}$ is $y' = \frac{3}{2} \ln(x-4)^{\frac{1}{2}}$ $y' = \frac{(4x^2-5)(3) - 3x(8x)}{(4x^2-5)^2}$
- ~~F~~ The derivative of $y = \frac{3x}{4x^2-5}$ is $y' = \frac{3}{8x}$ $y' = \frac{3(4x^2-5) - 24x^2}{(4x^2-5)^2}$
- ~~T~~ If $s(t)$ is the function of position of an object in motion, then $a(t) = s''(t)$ is equal to the function of the acceleration of the object. $u = \frac{3}{x}$
 $u' = 3x^{-1}$
 $u'' = -3x^{-2}$
 $u'' = \frac{-3}{x^2} (2) = \frac{-6}{x^2}$

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

- ~~C~~ The derivative for $y = 2e^{\frac{3}{x}}$ is:
 A) $y' = 2e^{\frac{3}{x}}$ B) $y' = 2e^3$ C) $y' = -\frac{6e^{\frac{3}{x}}}{x^2}$ D) $y' = 6x^2 e^{\frac{3}{x}}$
 $u = \sqrt{2x-4}$ $u' = \frac{1}{2}(2x-4)^{-\frac{1}{2}}(2)$
- ~~A~~ The derivative for $y = \ln\sqrt{2x-4}$ is:
 A) $y' = \frac{1}{2x-4}$ B) $y' = \frac{1}{2} \ln(2x-4)^{-\frac{1}{2}}$ $u' = \frac{1}{\sqrt{2x-4}}$ $y' = \frac{1}{\sqrt{2x-4}}$ $y' = \frac{1}{(\sqrt{2x-4})}$
 C) $y' = \frac{1}{2} \ln \frac{2}{\sqrt{2x-4}}$ D) $y' = \frac{1}{x-2}$ $y' = \frac{1}{2x-4}$
- ~~B~~ If the equation that gives the velocity of an object is $v(t) = \frac{2t^3 e^{6t}}{t}$, then the equation that gives the acceleration is:
 A) $a(t) = 6t^2 e^{6t}$ B) $a(t) = 6t^2 e^{6t} (2t+1)$ $u = 2t^3$ $v = e^{6t}$
 C) $a(t) = 36t^2 e^{6t}$ D) $a(t) = 12t^3 e^{6t}$ $u' = 6t^2$ $v' = 6e^{6t}$

III. Answer the following questions.

1) Find the SLOPE of the line tangent to $y = \frac{e^{3-2x}}{4}$ at $x = \frac{3}{2}$ (20 points)

$y = \frac{e^{3-2x}}{4}$ $y' = \frac{4(-2e^{3-2x}) - (e^{3-2x})(0)}{(4)^2}$
 e^{3-2x} $v = 4$ $y' = \frac{-8e^{3-2x}}{16}$ $y' = \frac{-e^{3-2x}}{2}$
 $-2e^{3-2x}$ $v' = 0$
 slope $y' = \frac{-e^{3-2x}}{2}$ $y' = \frac{-e^{3-2(\frac{3}{2})}}{2}$
 $y' = -e^0$

$m = \frac{-1}{2}$

$v'(t) = 2t^3 (6e^{6t}) + e^{6t} (6t^2)$
 $v'(t) = 12t^3 e^{6t} + 6t^2 e^{6t}$
 $v'(t) = 6t^2 e^{6t} [2t+1]$
 $u = \frac{3}{x}$
 $u' = 3x^{-1}$
 $u'' = -3x^{-2}$
 $u'' = \frac{-3}{x^2}$
 $y = 2e^{\frac{3}{x}}$
 $y = 2e^{3x^{-1}}$
 $y = -\frac{6}{x^2} e^{\frac{3}{x}}$

2) Find the derivative of $f(x) = \frac{(5x-1)^3}{x}$ (15 points)

$U = (5x-1)^3 \quad V = x$

$U' = 3(5x-1)^2(5) \quad V' = 1$

$U' = 15(5x-1)^2$

~~$y' = \frac{(5x-1)^2(10x+11)}{x^2}$~~

~~$y' = \frac{x[15(5x-1)^2] - (5x-1)^3(1)}{x^2}$~~

~~$y' = \frac{15x(5x-1)^2 - (5x-1)^3}{x^2}$~~

~~$y' = \frac{(5x-1)^2[15x - (5x-1)]}{x^2}$~~

~~$y' = \frac{(5x-1)^2[15x - 5x + 1]}{x^2}$~~

3) Find the derivative $g(x) = 7x^2 + \frac{1}{e^{3x}} + e^0 + \ln(5x^2+9)$ (15 points)

$g(x) = 7x^2 + e^{-3x} + e^0 + \ln(5x^2+9)$

$U = (5x^2+9)^{1-1} = 0$
 $U' = 10x$

$g'(x) = 14x + (-3xe^{-3x}) + e^0 + \frac{10x}{(5x^2+9)}$

$e^0 = e^0 = 1$

~~$g'(x) = 14x - \frac{3x}{e^{3x}} + \frac{10x}{(5x^2+9)}$~~

$y = 6 - e^{-x-1}$
 $y' = 0 + xe^{-x}$
 $y' = xe^{-x}$

$y = \ln(x-4)^{\frac{3}{2}}$
 $y' = \frac{3(x-4)^{\frac{1}{2}}}{2}$
 $y' = \frac{3(x-4)^{\frac{1}{2}}}{2(x-4)^{\frac{3}{2}}}$
 $y' = \frac{3}{2(x-4)}$

$y = \frac{3x}{4x^2-5}$
 $U = 3x \quad V = 4x^2-5$
 $U' = 3 \quad V' = 8x$
 $y' = \frac{(4x^2-5)(3) - (3x)(8x)}{(4x^2-5)^2}$
 $y' = \frac{3(4x^2-5) - 24x^2}{(4x^2-5)^2}$

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Math corrections

I. DETERMINE IF TRUE OR FALSE

1. THE DERIVATIVE OF $y = 0 - e^{-x}$ IS $y' = xe^{-x}$

$$y' = -x$$

$$y' = -1$$

(T) $y' = (-1) - e^{-x}$ $[y' = e^{-x}]$

II. ANSWER THE FOLLOWING

3. FIND THE DERIVATIVE OF $g(x) = 7x^2 + \frac{1}{e^{3x}} + e^0 + \ln(5x^2 + 19)$

$$g'(x) = 14x + (-3 \times e^{-3x}) + \frac{e^0}{1} + \frac{10x}{5x^2 + 19}$$

$$g'(x) = 14x - \frac{3x}{e^{3x}} + \frac{10x}{5x^2 + 19}$$