Prepa Tec
Calculus I 2nd partial
Quiz # 1A

Name Angel Guevara Mat. AC 1570288

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I. Circle the right answer. (5 point each)

1) Find the slope for $f(x) = -5x^2$ at $x = 3$

A) 30 B) – 75 C) – 45 D) -30

2) What is the equation of the tangent line for the curve $y = x^3+2$ at the point (-1,1)

A) $y = -3x + 4$ B) $y = 3x - 4$ C) $y = 3x + 4$ D) $y = -3x - 4$

3) The following functions is not differentiable at $x = -4$

a) $f(x) = |x+4|$ b) $f(x) = x^2 - 4$ c) $f(x) = \frac{x+2}{x-4}$ $f(x) = \sqrt{-x} + 4$

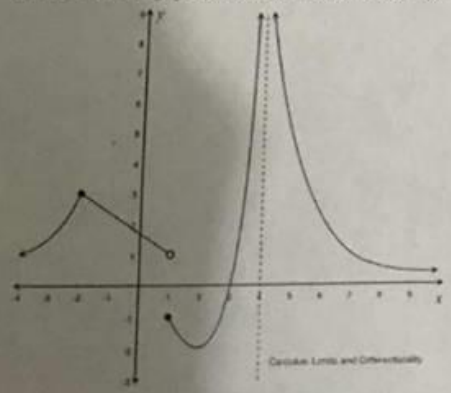
4) The following function is not differentiable at $x = 1$

a) $f(x) = \frac{1}{x+1}$ b) $y = (x-1)^{3/5}$ c) $f(x) = |x+1|$ d) $f(x) = \sqrt[3]{x-1}$

II. Answer the following questions.

1. The position of an object, s, at any time, t, is given by: (15 points)
$s(t) = -18t^3 + 15t + 8$ where s is measured in feet and t is measured in seconds.
Find the equation of acceleration at any time $a(t)$.

2. The following graph shows the function $y = f(x)$ (20 points)



a) Find the values of "x" where the function is not continuous
b) Find the values of "x" where the function is not differentiable

III. Find the **derivative by definition** of the following function: (15 points)

$f(x)=3x^2+5$ $f'(x)=6x$

$f'(x)=\lim_{h\to 0}\left(\frac{3(x+h)^2+5-3x^2+5}{h}\right)$

$f'(x)=\lim_{h\to 0}\left(\frac{3(x^2+2xh+h^2)+5-(3x^2+5)}{h}\right)$

$f'(x)=\lim_{h\to 0}\left(\frac{3x^2+6xh+3h^2+5-3x^2+5}{h}\right)$

$f'(x)=\lim_{h\to 0}\frac{h(6x+3h)}{h}$

$f'(x)=6x+3(0)$

$f'(x)=6x$

IV. Find the derivative of the following:

a) $f(x)=8\sqrt[4]{x^3}-2x^3+\frac{5}{x^2}$ (10 points)

$f(x)=8x^{\frac{3}{4}}-2x^3+5x^{-2}$

$f'(x)=6x^{-\frac{1}{4}}-6x^2-10x^{-3}$

$f'(x)=\frac{6}{\sqrt[4]{x}}-6x^2-\frac{10}{x^3}$

b) $f(x)=2(1-3x^2)^5+\sqrt{4x-1}$ (10 points)

$f(x)=2(1-3x^2)^5+(4x-1)^{\frac{1}{2}}$

$f'(x)=10(1-3x^2)^4(-6x)+\frac{1}{2}(4x-1)^{-\frac{1}{2}}(4)$

$f'(x)=-60x(1-3x^2)^4+2\frac{}{\sqrt{4x-1}}$

c) $f(x)=7(4x-5x^3)^6$ (10 points)

$f(x)=7(4x-5x^3)^6$

$f'(x)=42(4x-5x^3)^5(4-15x^2)$

$f'(x)=42(4-15x^2)(4x-5x^3)^5$

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$f(x) = \sqrt[3]{x-1}$

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