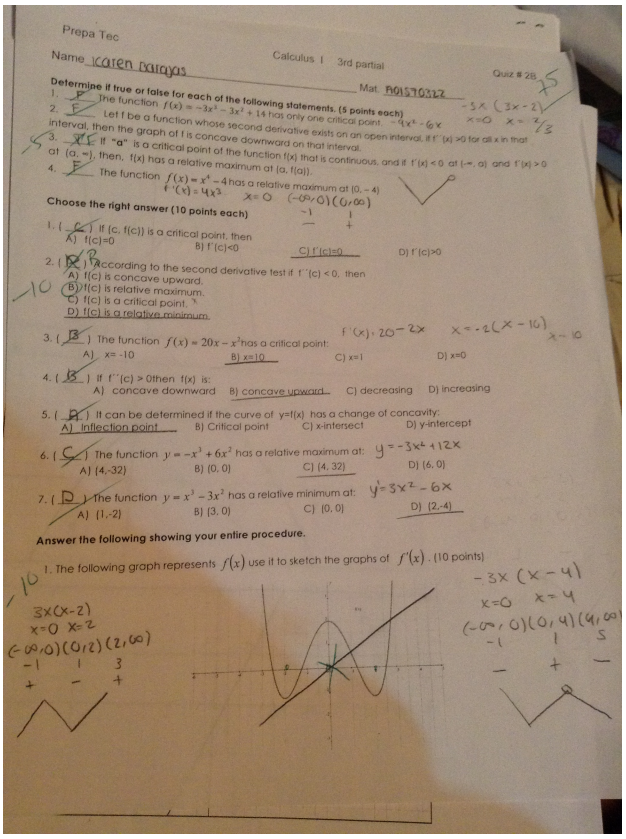
3rd Partial Quizzes



Prepa Tec

Calculus I 3rd partial

Quiz # 2B

Name Karen Barajas Mat. A01570322

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

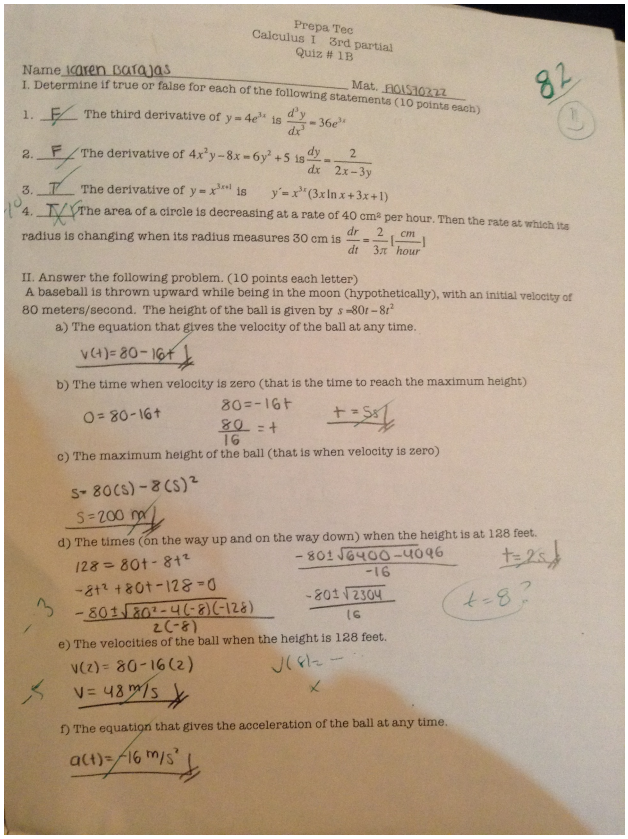
1. F The function $f(x) = -3x^3 - 3x^2 + 14$ has only one critical point.
2. F Let f be a function whose second derivative exists on an open interval. If $f'(x) > 0$ for all x in that interval, then the graph of f is concave downward on that interval.
3. F If "a" is a critical point of the function f(x) that is continuous, and if $f'(x) < 0$ at $(-\infty, a)$ and $f'(x) > 0$ at (a, ∞), then, f(x) has a relative maximum at (a, f(a)).
4. F The function $f(x) = x^4 - 4$ has a relative maximum at (0, – 4)

Choose the right answer (10 points each)

1. (C) If (c, f(c)) is a critical point, then
   A) f(c)=0 B) f'(c)<0 C) f'(c)=0 D) f'(c)>0
2. (D) According to the second derivative test if f''(c) < 0, then
   A) f(c) is concave upward.
   B) f(c) is relative maximum.
   C) f(c) is a critical point.
   D) f(c) is a relative minimum.
3. (B) The function $f(x) = 20x - x^2$ has a critical point:
   A) x= -10 B) x=10 C) x=1 D) x=0
4. (B) If f''(c) > 0 then f(x) is:
   A) concave downward B) concave upward C) decreasing D) increasing
5. (A) It can be determined if the curve of y=f(x) has a change of concavity:
   A) Inflection point B) Critical point C) x-intersect D) y-intercept
6. (C) The function $y = -x^3 + 6x^2$ has a relative maximum at:
   A) (4,-32) B) (0, 0) C) (4, 32) D) (6, 0)
7. (D) The function $y = x^3 - 3x^2$ has a relative minimum at:
   A) (1,-2) B) (3, 0) C) (0, 0) D) (2,-4)

Answer the following showing your entire procedure.

1. The following graph represents $f(x)$ use it to sketch the graphs of $f'(x)$. (10 points)



Prepa Tec

Calculus I 3rd partial

Quiz # 1B

Name Karen Barajas Mat. A01570322

I. Determine if true or false for each of the following statements (10 points each)

1. F The third derivative of $y = 4e^{3x}$ is $\frac{d^3y}{dx^3} = 36e^{3x}$
2. F The derivative of $4x^2y - 8x = 6y^2 + 5$ is $\frac{dy}{dx} = \frac{2}{2x - 3y}$
3. T The derivative of $y = x^{3x+1}$ is $y' = x^{3x}(3x \ln x + 3x + 1)$
4. T The area of a circle is decreasing at a rate of 40 cm² per hour. Then the rate at which its radius is changing when its radius measures 30 cm is $\frac{dr}{dt} = \frac{2}{3\pi}\left|\frac{cm}{hour}\right|$

II. Answer the following problem. (10 points each letter)

A baseball is thrown upward while being in the moon (hypothetically), with an initial velocity of 80 meters/second. The height of the ball is given by $s = 80t - 8t^2$

a) The equation that gives the velocity of the ball at any time.

$v(t) = 80 - 16t$

b) The time when velocity is zero (that is the time to reach the maximum height)

$0 = 80 - 16t$ $80 = -16t$ $\frac{80}{16} = t$ $t = 5s$

c) The maximum height of the ball (that is when velocity is zero)

$s = 80(5) - 8(5)^2$

$s = 200\ m$

d) The times (on the way up and on the way down) when the height is at 128 feet.

$128 = 80t - 8t^2$

$-8t^2 + 80t - 128 = 0$

$\frac{-80 \pm \sqrt{80^2 - 4(-8)(-128)}}{2(-8)}$ $\frac{-80 \pm \sqrt{2304}}{16}$ $\frac{-80 \pm \sqrt{6400 - 4096}}{-16}$ $t = 2s$ $t = 8?$

e) The velocities of the ball when the height is 128 feet.

$v(2) = 80 - 16(2)$

$v = 48\ m/s$

f) The equation that gives the acceleration of the ball at any time.

$a(t) = -16\ m/s^2$