Prepa Tec Calculus I 3rd partial Quiz # 2A

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

1. F The function $f(x) = x^4 - 4$ has a relative maximum at (0, – 4)
2. V If **"a"** is a critical point of the function f(x) that is continuous, and if f'(x) < 0 at (-∞, a) and f'(x) > 0 at (a, ∞), then, f(x) has a relative minimum at (a, f(a)).
3. V 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 upward on that interval.
4. F The function $f(x) = -3x^3 - 3x^2 + 14$ has only one critical point.

Choose the right answer (10 points each)

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