Quiz 2

Prepa Tec Calculus I Quiz # 2A 80

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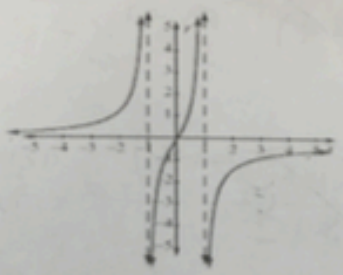
I. Write the letter of the correct answer on the line. (10 points each)

1. D Find $\lim_{x\to-\infty}\left[\frac{1}{x^3}+4\right]$

A) 0 B) ∞ C) 5 (D) 4

2. D Use the following graph to determine $\lim_{x\to\infty} f(x)$



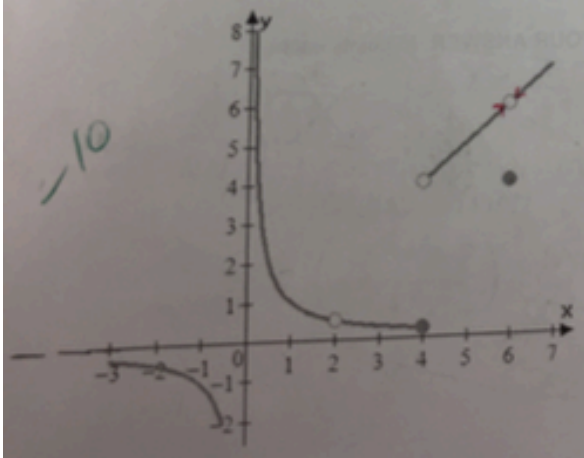
A) 1 B) -1 C) ∞ (D) 0

3. A Find $\lim_{x\to4}\frac{-1}{(x-4)^2}$

x	3.89	3.9	3.99	4	4.001	4.01
f(x)	-82.6	-100	-10'000	?	-10'000	-10'000

(A) -∞ B) +∞ C) 0 D) -1

II. For the function $f(x)$ whose graph is given, find the following limits (20 points)



,10

a) $\lim_{x\to+\infty} f(x) =$ ∞

b) $\lim_{x\to-\infty} f(x) =$ ∅

c) $\lim_{x\to6} f(x) =$ 6 $f(6) = 4$

d) $\lim_{x\to0^+} f(x) =$ +∞

Instructions: Solve the following excercises. Remember to write your solution procedure in an orderly fashion.

I. Find the following limits (10 points each)

1.- $\lim_{x\to 3}\left(\frac{2x^2-5x-3}{x^2-x-6}\right) = \lim_{x\to 3}\frac{(2x+1)(x-3)}{(x-3)(x+2)} = \lim_{x\to 3}\frac{(2x+1)}{(x+2)} = \lim_{x\to 3}\left(\frac{2x^2-5x-3}{x^2-x-6}\right) = \frac{7}{5}$

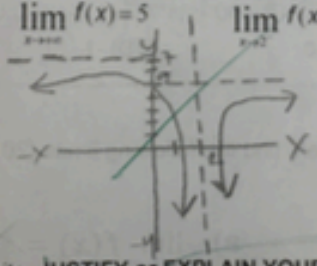
2.- $\lim_{x\to 7}\left(\frac{x^2-49}{3x-21}\right) = \lim_{x\to 7}\frac{(x+7)(x-7)}{3(x-7)} = \lim_{x\to 7}\frac{(x+7)}{3} = \lim_{x\to 7}\left(\frac{x^2-49}{3x-21}\right) = \frac{14}{3}$

3.- $\lim_{x\to 2}\left(\frac{x^3+8}{x+2}\right) = \lim_{x\to 2}\frac{(x+2)(x^2-2x+4)}{x+2} = \lim_{x\to 2}(x^2-2x+4) = 4-4+4 = 4$

$\lim_{x\to 2}\left(\frac{x^3+8}{x+2}\right) = 12$

II. Graph an example of a fucntion that satisfies the following conditions: (10 points)

a) $\lim_{x\to 2^-} f(x) = -\infty$ $\lim_{x\to +\infty} f(x) = 5$ $\lim_{x\to 2^+} f(x) = -\infty$ $\lim_{x\to -\infty} f(x) = 7$



III. Evaluate the following limits. **JUSTIFY or EXPLAIN YOUR ANSWER** (5 points each)

a) $\lim_{x\to\infty}\left(\frac{7-6x^2}{2x+9}\right) = \lim_{x\to\infty}\left(\frac{7-6x^2}{2x+9}\right) = \lim_{x\to\infty}\left(\frac{7-6x^2}{2x+9}\right) = -5$

$n>m$ $\frac{-6}{2} = -3$

multiplying a limit by an exponent is zero, due to the tendency of getting closer to that value.

b) $\lim_{x\to\infty}\left(\frac{5x^4-3}{x^2+6x}\right) = \lim_{x\to\infty}\left(\frac{\infty-3}{\infty+\infty}\right) = \lim_{x\to\infty}\left(\frac{5x^4-3}{x^2+6x}\right) = \infty$

$n>m$ 4

3 Rules of Horz. Asymp

why?

Corrections Quiz 2

II. Find the following limits.

a) $\lim_{x \to +\infty} f(x) = \infty$

c) $\lim_{x \to 6} f(x) = 6$ $f(6) = 4$

(3) $\lim_{x \to 2} \left(\frac{x^3+8}{x+2}\right) = \lim_{x \to 2} \left(\frac{2^3+8}{2+2}\right)$

$\lim_{x \to 2} \frac{(8+8)}{4} = \frac{16}{4} = 4$ $\lim_{x \to 2} \left(\frac{x^3+8}{x+2}\right) = 4$ ✓

III. Evaluate the following limits.

a) $\lim_{x \to \infty} \left(\frac{7-6x^2}{2x^2+9}\right) = \frac{-6}{+2} = -3$ // $\lim_{x \to \infty} \left(\frac{7-6x^2}{2x^2+9}\right) = -3$ //

Horizontal Asym rule, same degree → a/b

b) $\lim_{x \to \infty} \left(\frac{5x^4-3}{x^2+6x}\right) =$ DNE

Numerator has a bigger degree, limit doesn't exist.