

Math 2215 - Calculus 1

Quiz #3 - 2009.09.08

Solutions

Answer the following questions given the following function:

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

1. Compute $\lim_{x \rightarrow 1^+} f(x)$

$$\lim_{x \rightarrow 1^+} f(x) = +\infty$$

2. Compute $\lim_{x \rightarrow 1^-} f(x)$

$$\lim_{x \rightarrow 1^-} f(x) = +\infty$$

3. Compute $\lim_{x \rightarrow 0^-} f(x)$

$$\lim_{x \rightarrow 0^-} f(x) = -\infty$$

4. Compute $\lim_{x \rightarrow 0^+} f(x)$

$$\lim_{x \rightarrow 0^+} f(x) = +\infty$$

5. Find all horizontal or slant asymptotes.

Since the degree in the numerator is the same as that of the denominator, we get a horizontal asymptote. The value is the ratio of the leading coefficients, which in the case, is 2. So the horizontal asymptote is $y = 2$.