

VI Exercise Lesson

Monday, November 10th 2014

Ex. 1 For each of the following functions find, if they exist, vertical and horizontal asymptotes:

1.

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

2.

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

3.

$$f(x) = \sqrt{\frac{2 - x}{x^3 + 5x^2 - 6x}}$$

4.

$$f(x) = \frac{|\ln(x^2 + x)|}{e^x - 1}$$

5.

$$f(x) = \frac{\sqrt{(2x - x^2)}}{xe^{3x}}$$

Ex. 2 State where the following functions are continuous on their domain. Classify (if any) the points in which they are discontinuous.

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

2. $f(x) = \begin{cases} e^x - 1 & x < 0 \\ x & 0 \leq x \leq 1 \\ \ln(2x - 1) & x > 1 \end{cases}$

3. $f(x) = \begin{cases} x & \text{if } x < 0 \\ x^2 & \text{if } x \geq 0 \end{cases}$

4. $f(x) = \begin{cases} \frac{x^2 - 4}{x - 2} & \text{if } x \neq 2 \\ 3 & \text{if } x = 2 \end{cases}$

5. $f(x) = \begin{cases} \frac{1 + x^3}{1 - x^2} & \text{if } x \neq -1, x \neq 1 \\ \frac{3}{2} & \text{if } x = -1 \end{cases}$