VII Exercise Lesson

Wednesday, November 19th 2014

Ex. 1 Calculate the first derivative of each of the following functions:

1. $$f(x) = \frac{x^2 + 3x + 2}{1 - x^2}$$
2. $$f(x) = (x + 3)e^{1-x}$$
3. $$f(x) = \frac{2 - x}{x^3 + 5x^2 - 6x}$$
4. $$f(x) = \frac{2x - x^2}{xe^{3x}}$$

Ex. 2 Given the function

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

1. Find the domain, the axis intercepts and study the sign of f
2. Find, if they exist, horizontal and vertical asymptotes
3. Calculate $f'(x)$. Determine the intervals in which the function increases or decreases. Find (if they exist) local maxima and minima.
4. Draw the graph of the function

Ex. 3 Given the function

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

1. Find the domain, the axis intercepts and study the sign of f
2. Find, if they exist, horizontal and vertical asymptotes
3. Calculate $f'(x)$. Determine the intervals in which the function increases or decreases. Find (if they exist) local maxima and minima.
4. Draw the graph of the function

Ex. 4 Given the function

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

1. Find the domain, the axis intercepts and study the sign of f
2. Find, if they exist, horizontal and vertical asymptotes
3. Calculate $f'(x)$. Determine the intervals in which the function increases or decreases. Find (if they exist) local maxima and minima.
4. Draw the graph of the function