MATH 31

Name

2020 Curves Assignment

- 1. Identify the intervals of increase and decrease for y = f(x) given $f'(x) = \frac{x-5}{(x-2)^2}$.
- 2. Identify the intervals of concave up and concave down for y = f(x) given $f''(x) = \frac{x^2 2x 15}{x^2 + 1}$.
- 3. For the curve $y = 3x^4 4x^3 54x^2 + 108x$, find the local maximum and/or minimum values using the first and/or second derivatives.
- 4. For the curve $f(x) = x^4 6x^2 + 9$
 - a) Find the intervals of concavity.
 - b) Find any inflection points.
- 5. Given, $f(x) = \frac{5x^2 3x 8}{x^2 9}$

Determine the equation for the vertical and horizontal asymptotes of the function.

6. Sketch the function given:

The domain is $(-\infty, 9]$. The x-intercepts are 0 and 9. The horizontal asymptote is the line y = -2. There are no vertical asymptotes. The interval of increase is $(-\infty, 5)$. The interval of decrease is (5,9). The absolute maximum value is where f(x) = 8. The function is concave upward $(-\infty, 2)$ and concave downward (2,9). The point of inflection is (2,5).

