

2,3,4

136.151: Test #2
20 minutes

Name: _____

Student Number: _____

1. (a) Compute $\lim_{x \rightarrow \infty} \frac{x-1}{x+1}$. Write the equation of one horizontal asymptote of the function $f(x) = \frac{x-1}{x+1}$.

(b) Compute $\lim_{x \rightarrow -1^-} \frac{x-1}{x+1}$. Write the equation of one vertical asymptote of the function $f(x) = \frac{x-1}{x+1}$.

2. Compute $f'(2)$ if $f(x) = 3x^2$ using **ONLY** the definition of the derivative of a function.

3. (a) Given $f(x) = \frac{\sqrt{x}}{x^2 - 1}$, compute $f'(x)$. Use the rules of differentiation. Do not simplify your answer after differentiating.

(b) Suppose $x(t) = t^3 - 2t$ is the distance measured in meters between a particle moving along the x -axis and the origin (with respect to the time t measured in seconds). What is the acceleration at the moment when $t = 2$ sec?