

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?