

## Math 155 Worksheet 4

Name:

ID:

1. Find  $\lim_{x \rightarrow \infty} \frac{1 + 2x - x^2}{1 - x + 2x^2}$ .

2. Find  $\lim_{x \rightarrow \infty} (\sqrt{x^2 + 4x + 1} - x)$ .

3. If  $f(x) = x^2 + 1$ , find  $f(2 + h)$ , and compute  $\lim_{h \rightarrow 0} \frac{f(2 + h) - f(2)}{h}$ .

4. Find an equation of the line tangent to the curve  $y = x^2 + 1$  when  $x = 2$ .

5. If an arrow is shot upward on the moon with velocity of 58m/s, its height (in meters) after  $t$  seconds is given by  $H(t) = 58t - 0.83t^2$ .

- (a) Find the velocity of the arrow after one second.
- (b) Find the velocity when  $t = a$ .
- (c) When will the arrow hit the moon?
- (d) With what velocity will the arrow hit the moon?