

Name: _____ Score: _____

Teacher: _____ Date: _____

Limits at Infinity – Polynomial functions

1. Evaluate this limit $\lim_{x \rightarrow \infty} \frac{3x^5 + 2x^3 - x^2 + 6x}{-7x^5 + 5}$

2. For $f(x) = 3x^5 - 12x^2 + 7$ evaluate each of the following limits.

(a) $\lim_{x \rightarrow -\infty} f(x)$

(b) $\lim_{x \rightarrow \infty} f(x)$

For problems 3 – 10 answer each of the following questions.

(a) Evaluate $\lim_{x \rightarrow -\infty} f(x)$

(b) Evaluate $\lim_{x \rightarrow \infty} f(x)$

(c) Write down the equation(s) of any horizontal asymptotes for the function.

3. $f(x) = \frac{6 - 5x^2}{7x^2 + 3x}$

4. $f(x) = \frac{4x^7 - 3x^2 + 6}{7 - 9x^2}$

5.
$$f(x) = \frac{21x^4 - 3x^3}{2x + 8x^2 + 7x^4}$$

6.
$$f(x) = \frac{x^3 - 5x + 8}{7 - 4x^5}$$

7.
$$f(x) = \frac{2x^6 - 3x^4 + x^2 - 3}{5x^6 + 3x^3 + 8}$$

8.
$$f(x) = \frac{\sqrt{7 + 16x^2}}{1 - 3x}$$

9.
$$f(x) = \frac{x + 6}{\sqrt{3x^2 + 2}}$$

10.
$$f(x) = \frac{7 + x - 3x^2}{\sqrt{5x^4 + x^2 + 8}}$$