

Name: _____

HW6: Limits to Infinity and Beyond

Find the following limits:

1. $\lim_{x \rightarrow \infty} \left(\frac{3x^2 + 4x - 5}{2x^2 - 5} \right)$

2. $\lim_{x \rightarrow \infty} \left(\frac{2x^2 + 3x - 500}{4x^2 - 5x} \right)$

3. $\lim_{x \rightarrow \infty} \left(\frac{7x^3 + 4x^2 - 5}{2x^3 - 3x} \right)$

4. $\lim_{x \rightarrow \infty} \left(\frac{3x^3 + 5x^2 - 10}{4x^5 - 5} \right)$

5. $\lim_{x \rightarrow \infty} \left(\frac{3x^5 + 3x^2 + 12}{4x^5 - 17} \right)$

6. $\lim_{x \rightarrow \infty} \left(\frac{\sqrt{3x^2 + 5x - 10}}{4x - 5} \right)$

7. $\lim_{x \rightarrow -\infty} \left(\frac{\sqrt{3x^2 + 5x - 10}}{4x - 5} \right)$

8. $\lim_{x \rightarrow \infty} \left(\frac{5}{4x - 5} \right)$

Find the horizontal asymptotes:

9. $y = \frac{3x^5 + 3x^2 + 12}{4x^5 - 17}$

10. $y = \frac{2x^2 + 3x - 500}{5x^3 - 3x}$

11. $y = \frac{5x^3 + 3x + 2500}{10x^3 - 27x}$

12. $y = \frac{12x^2 + 500}{4x^5 + 70x}$

Limits to Infinity and Beyond: KEY

1. $\frac{3}{2}$

2. $\frac{1}{2}$

3. $\frac{7}{2}$

4. 0

5. $\frac{3}{4}$

6. $\frac{\sqrt{3}}{4}$

7. $-\frac{\sqrt{3}}{4}$

8. 0

9. $y = \frac{3}{4}$

10. $y = 0$

11. $y = \frac{1}{2}$

12. $y = 0$