10.3 More on Limits
Target 9A: Evaluate a limit of a function algebraically
Target 9C: Evaluate a limit of a function graphically

Review of Prior Concepts

HINT: Think about the parent functions

1. $\lim\limits_{x \to \infty} (x^2 + 3x - 2)$

2. $\lim\limits_{x \to -\infty} (x^2 + 3x - 2)$

3. $\lim\limits_{x \to \infty} (x^3 + 2)$

4. $\lim\limits_{x \to -\infty} (x^3 + 2)$

5. $\lim\limits_{x \to \infty} (e^x)$

6. $\lim\limits_{x \to -\infty} (e^x)$

More Practice

End Behavior
http://www.coolmath.com/precalculus-review-calculus-intro/precalculus-algebra/14-tail-behavior-limits-at-infinity-02
https://quizlet.com/48500929/end-behavior-of-12-basic-functions-flash-cards/
http://www.mathguide.com/cgi-bin/quizmasters3/EB.cgi
https://youtu.be/Krjd_vU4Uvg

Limits at Infinity
(end behavior of a graph/function)

Example 1:

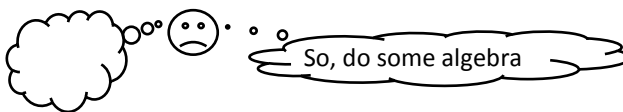**a)** Find $\lim\limits_{x \to \infty} \left(\dfrac{3}{x}\right)$

$\dfrac{3}{\infty}$

As x approaches ∞, the graph of $\dfrac{3}{x}$ approaches 0.

b) Find $\lim\limits_{x \to -\infty} \left(\dfrac{3}{x}\right)$

As x approaches ____ , the graph of $\dfrac{3}{x}$ approaches ____

Example 2:

a) Find $\lim\limits_{x\to\infty} \left(\dfrac{x-2}{3x-4}\right)$

So, do some algebra

⊞ Check answer graphically (graph the function & the answer)

b) Find $\lim\limits_{x\to-\infty} \left(\dfrac{6x}{3x+4}\right)$

c) Find $\lim\limits_{x\to\infty} \left(\dfrac{8x-1}{2x+3}\right)$ (Can you see the answer quickly—w/o work?)

Conclusion:
If degree of Numerator ___ degree of Denominator, then $\lim\limits_{x\to\infty} f(x) = $

(and, Horizontal Asymptote @ $y = $)

Example 3:

a) Find $\lim\limits_{x\to\infty} \left(\dfrac{x-2}{3x^2-4}\right)$

b) Find $\lim\limits_{x\to-\infty} \left(\dfrac{6x}{3x^2+4}\right)$

Conclusion:
If degree of Numerator ___ degree of Denominator, then $\lim\limits_{x\to\infty} f(x) = $

(and, Horizontal Asymptote @ $y = $

Example 4:

a) Find $\lim\limits_{x\to\infty} \left(\dfrac{x^2-2}{3x-4}\right)$

b) Find $\lim\limits_{x\to-\infty} \left(\dfrac{6x^2}{3x+4}\right)$

Conclusion:

If degree of Numerator _____ degree of Denominator, then $\lim\limits_{x\to\infty} f(x) = $ _____

(and, NO Horizontal Asymptote)

Homework Assignment
Worksheet