Course Number
Instructor
Date

Section 11.4 Limits at Infinity and Limits of Sequences

Objective: In this lesson you learned how to evaluate limits at infinity and find limits of sequences.

What you should learn How to evaluate limits of functions at infinity

I. Limits at Infinity and Horizontal Asymptotes (Pages 811–814)

Define **limits at infinity.**

To help evaluate limits at infinity, you can use the following:

If r is a positive real number, then $\lim_{x\to\infty}\frac{1}{x^r}=$ ___________.

If x^r is defined when $x < 0$, then $\lim_{x\to-\infty}\frac{1}{x^r}=$ ___________.

Example 1: Find the limit: $\lim_{x\to\infty}\frac{1+5x-3x^3}{x^3}$

If $f(x)$ is a rational function and the limit of f is taken as x approaches ∞ or $-\infty$,

- When the degree of the numerator is less than the degree of the denominator, the limit is ____________________.
- When the degrees of the numerator and the denominator are equal, the limit is _____________________________ _____________________.
- When the degree of the numerator is greater than the degree of the denominator, the limit ________________ ______________________.

Larson/Hostetler/Edwards *Precalculus with Limits: A Graphing Approach, Fifth Edition* Student Notetaking Guide
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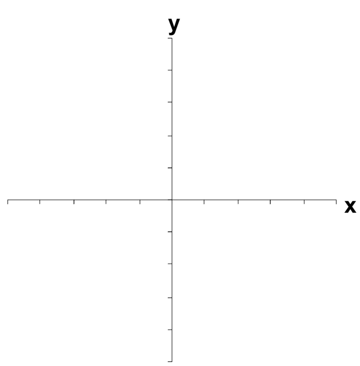
II. Limits of Sequences (Pages 815–816)

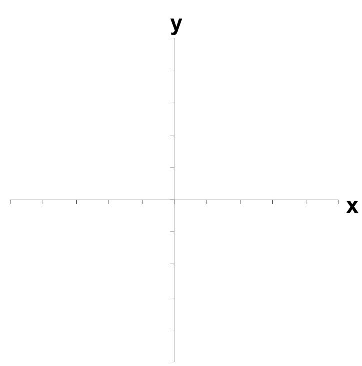
What you should learn
How to find limits of sequences

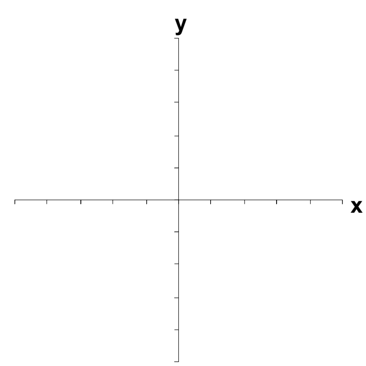
For a sequence whose nth term is a_n, as n increases without bound, if the terms of the sequence get closer and closer to a particular value L, then the sequence is said to _______________ to L. Otherwise, a sequence that does not converge is said to _______________.

Give the definition of the limit of a sequence.

Example 2: Find the limit of the sequence $a_n = \dfrac{(n-3)(4n-1)}{4-3n-n^2}$.







Homework Assignment

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Exercises

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