

Calculus, Chapter 2 Review

2.1 Rates of Change and Limits

- Average speed vs. instantaneous speed
- Slope has meaning—remember to include units of measure.
- Limits:
 - General idea: What do the function values (y -values) approach as we come from both sides?
 - DNE? Why?
 - Properties of limits (page 58)
 - One-sided vs. two sided
 - Sandwich theorem
 - Numerical, graphical, and analytical approaches
 - Special limit: $\lim_{x \rightarrow 0} \frac{\sin x}{x}$

2.2 Limits Involving Infinity

- Horizontal asymptotes: The line $y = b$ is a horizontal asymptote for $f(x)$ if $\lim_{x \rightarrow \infty} f(x) = b$ or $\lim_{x \rightarrow -\infty} f(x) = b$.
- $\lim_{x \rightarrow c} f(x) = \infty$ vs. $\lim_{x \rightarrow c} f(x)$ DNE.

2.3 Continuity

- $\lim_{x \rightarrow c} f(x) = f(c)$
- Continuous extensions
- Types of discontinuities.

2.4 Rates of Change and Tangent Lines

- Average rate of change over an interval: $\frac{\Delta y}{\Delta x} = \frac{f(b) - f(a)}{b - a}$
- Tangent line: the limit of secant lines
- Normal line
- Instantaneous rate of change: Danger Dan type of problems

RECOMMENDED PROBLEMS: page 91(1, 5, 13, 15, 18, 25, 29, 39, 41, 47, 53)