Kerry Ojakian's MTH 31 Class
Class Assignment #3

Compute the following limits by calculation and guessing.

1. $\lim_{x\to 3} 2x$ (use x near 3, like $2.8, 2.9, 3.1, 3.2$)

2. $\lim_{x\to 1} \dfrac{x^2-1}{x-1}$ (use x "near" 1)

3. $\lim_{x\to 0} \dfrac{\sin x}{x}$ (use x "near" 0)

Compute the following limits using direct substitution and algebra.

4. $\lim_{x\to 1} \dfrac{x^2-1}{x-1}$

5. $\lim_{x\to -2} \dfrac{10(x-8)(x+2)}{x+2}$

6. $\lim_{x\to 8} \dfrac{10(x-8)(x+2)}{x+2}$

7. $\lim_{x\to -3} \dfrac{10(x^2-9)}{x+3}$

8. $\lim_{x\to -4} \dfrac{x^2+9x+20}{x+4}$

9. $\lim_{x\to -3} \dfrac{3x^2+11x+6}{x+3}$

See pictures in the textbook for the following. FIRST, ignore the left/right and just state DNE if that applies and why?

10. Section 2.2 (page 156): Exercises 46 - 49.

11. Section 2.2 (page 157): Exercises 59 -64.

Compute the following limits.

12. Let $f(x) = \begin{cases} -2x & \text{if } x \leq -1 \\ x+3 & \text{if } x > -1 \end{cases}$

    Find $\lim_{x\to 0} f(x)$ and $\lim_{x\to -1} f(x)$

13. Let $f(t) = \begin{cases} t^2 & \text{if } t \leq -2 \\ t^3 & \text{if } t > -2 \end{cases}$

    Find $\lim_{t\to -3} f(t)$ and $\lim_{t\to -2} f(t)$

In the following exercises, sketch the graph of a function with the given properties.

14. $\lim_{x\to 0} f(x) = 3$ and $\lim_{x\to 2} f(x) = 1$

15. $\lim_{x\to 5} g(x) = 0$ and $\lim_{x\to 7} g(x)$ DNE.

In the following exercises, given the equation of a function with the given properties (may be piece-wise!).

16. $\lim_{x\to 0} f(x) = 3$ and $\lim_{x\to 2} f(x) = 1$

17. $\lim_{x\to 5} g(x) = 0$ and $\lim_{x\to 7} g(x)$ DNE.