

MATH 151 Homework 5

Due 2/4

Read Section 2.3.

Do Section 2.1 Exercise 7(b)

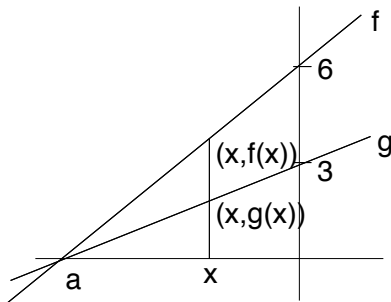
Do Section 2.3 Exercises 1, 2, 3, 11, 19, 22 (hint: conjugates)

Also, do the following exercises. Justify your answer with complete sentences for the true/false and multiple choice questions.

SF11. The statement “Whether or not $\lim_{x \rightarrow a} f(x)$ exists depends on how $f(a)$ is defined,” is true

- (a) Always
- (b) Sometimes
- (c) Never

SF12. Suppose you have two linear functions f and g whose graphs are shown below.



Then $\lim_{x \rightarrow a} \frac{f(x)}{g(x)}$ is

- (a) 2
- (b) does not exist
- (c) not enough information
- (d) 3

SF13. Suppose that

$$\lim_{x \rightarrow 2^-} f(x) = 0 \quad \lim_{x \rightarrow 2^+} f(x) = 1 \quad \lim_{x \rightarrow 2^-} g(x) = 1 \quad \lim_{x \rightarrow 2^+} g(x) = 0$$

$$h(x) = \frac{x^2 - 4}{x - 2} \quad j(x) = \begin{cases} 1 & \text{if } x < 2 \\ 0 & \text{if } x \geq 2 \end{cases}$$

Compute the following:

(a) $\lim_{x \rightarrow 2} [g(x) + h(x)]$

(b) $\lim_{x \rightarrow 2} [f(x) + j(x)]$

(c) $\lim_{x \rightarrow 2} [f(x)g(x)]$

SF14. Suppose f is some function and a and b are real numbers. Write formulas for the numbers described below, using the function f and any limits that you want.

(a) The slope of the line connecting the points on the graph of f where $x = a$ and $x = b$.

(b) The slope of the line tangent to the graph of f at the point where $x = a$.

(c) The y -intercept of the line tangent to the graph of f at the point where $x = a$.

SF15. Find the equation of the line tangent to the graph $y = x^2$ at the point $(2, 4)$. Recall that we computed the slope of this line in class on Friday.