

Section 1.1: Four Ways to Represent a Function**Problem 1.**

- (a) Sketch the graph of the function $p(x) = \frac{|x+1|}{x+1}$.
- (b) State the domain and range of the function p using set-builder or interval notation.

Section 1.2: A Catalog of Essential Functions

Problem 2. The manager of a furniture factory finds that it costs \$2200 to manufacture 100 chairs in one day and \$4800 to produce 300 chairs in one day.

- (a) Express the cost as a function of the number of chair produced, assuming that it is linear. Then sketch the graph.
- (b) What is the slope of the graph and what does it represent?
- (c) What is the y -intercept of the graph and what does it represent?

Problem 3. Find the domain of each of the following functions:

$$(a) f(x) = \frac{x+2}{x^2-5x},$$

$$(b) g(x) = \frac{1}{\sqrt[4]{x^2-5x}},$$

$$(c) h(x) = \frac{1}{\sqrt[5]{x^2-5x}}.$$

Please state your answer in set or interval notation.

Section 1.3: New Functions from Old Functions

Problem 4. Graph the following functions by hand, not by plotting points, but by starting with the graph of one of the essential functions and then applying the appropriate transformations.

$$(a) f(x) = 2 - (x+1)^2,$$

$$(b) g(x) = 3 \sin\left(\frac{1}{2}x\right).$$

Problem 5. Let $f(x) = 3x - 2$, $g(x) = \cos(x)$, and $h(x) = x^2$.

Find

(a) $f + h$,

(b) f/h ,

(c) $f \circ g$,

(d) $g \circ f$,

(e) $f \circ g \circ h$.