MATH 161 — Precalculus[1]
Community College of Philadelphia

Math 161 — Chapter 5 Homework

1. Make graphs by hand of the following functions:

   (a) $f(x) = \sqrt{x} + 2$

   (b) $g(x) = \sqrt{3 - x} - 2$

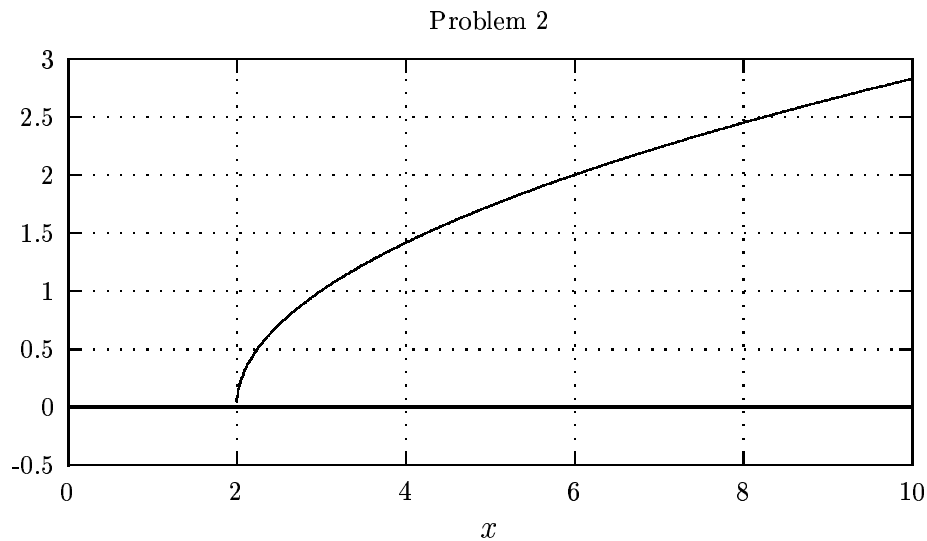   (c) $h(x) = \sqrt{x - 3} - 2$

   (d) $i(x) = \sqrt{x + 2}$

   (e) $j(x) = \sqrt{x} + 2$

   (f) $k(x) = \sqrt{x - 3} - 2$

   (g) $l(x) = 2\sqrt{x - 3} - 2$

2. Consider the square-root function illustrated below:

Problem 2

   Using values read from the graph, estimate the *average rate of change* of the function over the following intervals:

   (a) $[2, 4]$

   (b) $[4, 6]$

   (c) $[6, 8]$

3. Make graphs by hand of the following functions:

    (a) $f(x) = |x| + 2.5$

    (b) $g(x) = |x + 2.5|$

    (c) $h(x) = 2.5|x|$

    (d) $i(x) = -|x| + 2.5$

    (e) $j(x) = 2|x - 2| - 3$

    (f) $k(x) = 2(|x - 2| - 3)$

4. Consider the function $g(x) = 2|x|$. Calculate the *average rate of change* of the function over the following intervals:
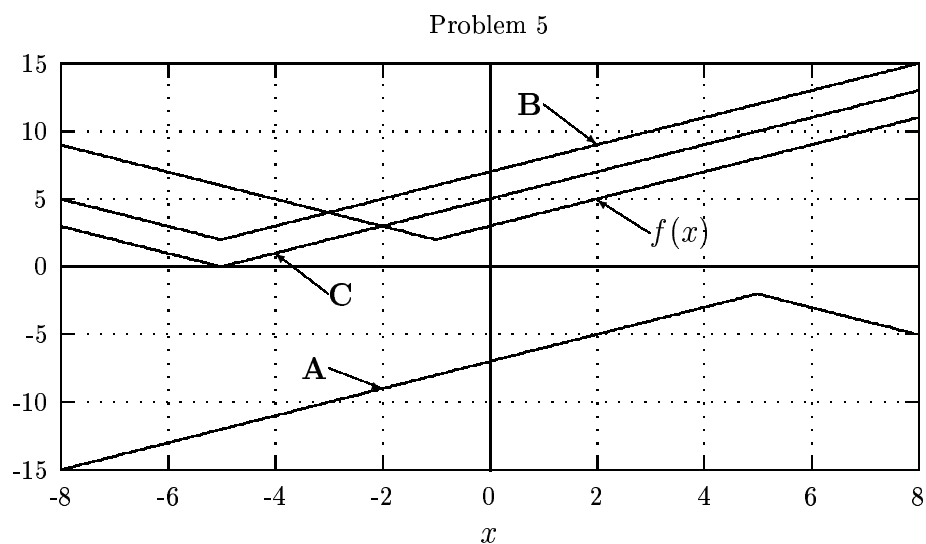
    (a) $[0, 1]$

    (b) $[2, 10]$

    (c) $[23, 41.2]$

    (d) $[-2, -1]$

    (e) $[-12.4, -3]$

    (f) $[-1, 1]$

    (g) $[-1, 2]$

5. The graph below includes plots of four absolute value functions.

Problem 5

The four functions are given below. Match the functions with the label of the appropriate graph.
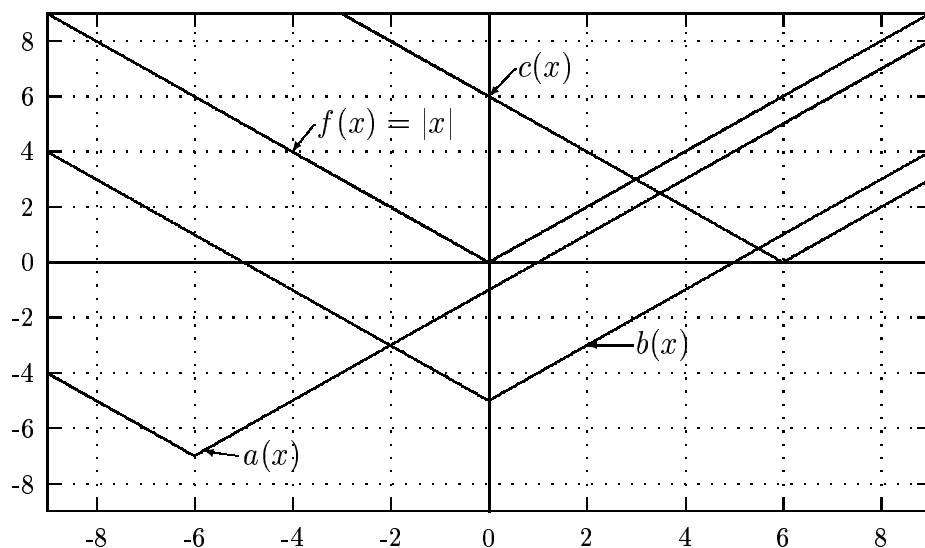
$$f(x) = |x+1| + 2$$
$$g(x) = |x+5| \qquad \text{Graph:} \underline{\hspace{1cm}}$$
$$h(x) = -|x-5| - 2 \qquad \text{Graph:} \underline{\hspace{1cm}}$$
$$i(x) = |-x-5| + 2 \qquad \text{Graph:} \underline{\hspace{1cm}}$$
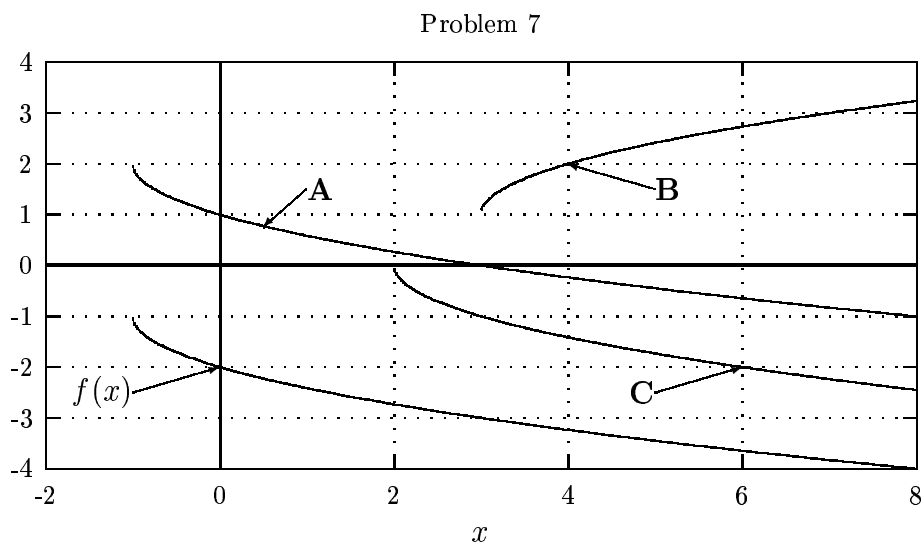
6. The function $f(x) = |x|$ is plotted on the graph below, along with three functions that are simple translations of the function f.

(a) Give the formula for the function $a(x)$.

(b) Give the formula for the function $b(x)$.

(c) Give the formula for the function $c(x)$.

7. The graph below includes plots of four square-root functions.

Problem 7

The four functions are given below. Match the functions with the label of the appropriate graph.

$$
\begin{aligned}
f(x) &= -\sqrt{x+1} - 1 \\
g(x) &= \sqrt{x-3} + 1 & &\text{Graph: _____} \\
h(x) &= -\sqrt{x+1} + 2 & &\text{Graph: _____} \\
i(x) &= -\sqrt{x-2} & &\text{Graph: _____}
\end{aligned}
$$

8. The function $f(x) = \sqrt{x}$ is plotted on the graph below, along with three functions that are simple translations of the function f.

   (a) Give the formula for the function a.

   (b) Give the formula for the function b.

   (c) Give the formula for the function c.

Problem 8