

Worksheet 8

Sections 2.6 and 2.7

Section 2.6

Problem 1. Let $f(x) = x^2$. Explain how the graphs of the functions given below are obtained from the graph of f .

$$(a) g(x) = (x + 2)^2, \quad (b) h(x) = -x^2 - 2.$$

(c) Sketch the graphs of f , g , and h without plotting points.

Problem 2. Let $f(x) = |x|$. Explain how the graphs of the functions given below are obtained from the graph of f .

$$(a) g(x) = |x + 3| - 1, \quad (b) h(x) = |x - 3| + 1.$$

(c) Sketch the graphs of f , g , and h without plotting points.

Problem 3. Let $f(x) = \sqrt{x}$. Explain how the graphs of the functions given below are obtained from the graph of f .

$$(a) g(x) = -\sqrt{x} + 1, \quad (b) h(x) = \sqrt{-x} + 1.$$

(c) Sketch the graphs of f , g , and h without plotting points.

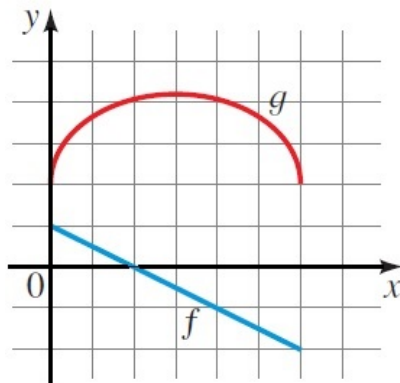
Problem 4. Determine whether the following functions are even, odd, or neither. If the function is even or odd, use symmetry to sketch its graph.

(a) $f(x) = x^2 + x$, (b) $g(x) = x^3 - x$, (c) $h(x) = x^4 - 4x^2$.

Section 2.7

Problem 5. From the graphs of f and g in the figure below find

(a) $(f + g)(2)$, (b) $(f - g)(2)$, (c) $(fg)(2)$, (d) $\left(\frac{f}{g}\right)(2)$, (e) $(f \circ g)(2)$, (f) $(g \circ f)(2)$.



Problem 6. Let

$$f(x) = \frac{1}{\sqrt{x}} \quad \text{and} \quad g(x) = x^2 - 4x.$$

- (a) Find the functions $(fg)(x)$, $\left(\frac{g}{f}\right)(x)$, $(g \circ f)(x)$, $(f \circ g)(x)$, $(f \circ f)(x)$, and $(g \circ g)(x)$.
(b) Find the domains of each of the functions in part (a).