Section 1.3

27) Questions on function composition.
   a) How is the graph of \( y = f(|x|) \) related to the graph of \( f \)?
   b) Sketch the graph of \( y = \sin |x| \).
   c) Sketch the graph of \( y = \sqrt{|x|} \).

35) Find the functions a) \( f \circ g \), b) \( g \circ f \), c) \( f \circ f \), and d) \( g \circ g \) and their domains, where \( f(x) = x + 1/x \), \( g(x) = (x + 1)/(x + 2) \).

37) Find \( f \circ g \circ h \) where \( f(x) = 3x - 2 \), \( g(x) = \sin(x) \), and \( h(x) = x^2 \).

47) Express \( R(x) = \sqrt{\sqrt{x} - 1} \) in the form \( f \circ g \circ h \).

51) Use the given graphs of \( f \) and \( g \) to evaluate each expression, or explain why it is undefined.
   a) \( f(g(2)) \)
   b) \( g(f(0)) \)
   c) \( (f \circ g)(0) \)
   d) \( (g \circ f)(6) \)
   e) \( (g \circ g)(-2) \)
   f) \( (f \circ f)(4) \)

55) A ship is moving at a speed of 30 km/h parallel to a straight shoreline. The ship is 6 km from shore and it passes a lighthouse at noon.
   a) Express the distance \( s \) between the lighthouse and the ship as a function of \( d \), the distance the ship has traveled since noon; that is, find \( f \) so that \( s = f(d) \).
   b) Express \( d \) as a function of \( t \), the time elapsed since noon; that is, find \( g \) so that \( d = g(t) \).
   c) Find \( f \circ g \). What does this function represent?

60) If you invest \( x \) dollars at 4\% interest compounded annually, then the amount \( A(x) \) of the investment after one year is \( A(x) = 1.04x \). Find \( A \circ A \), \( A \circ A \circ A \), and \( A \circ A \circ A \circ A \). What do these compositions represent? Find a formula for the composition of \( n \) copies of \( A \).

63) Suppose \( g \) is an even function and let \( h = f \circ g \). Is \( h \) always an even function?
Section 1.5

3) Use the Law of Exponents to rewrite and simplify the following expressions:
   a) \( b^5(2b)^4 \)
   b) \( (6y^3)^4/(2y^5) \)

8) Graph the given functions on a common screen. How are these graphs related?
   a) \( y = e^x \)
   b) \( y = e^{-x} \)
   c) \( y = 8^x \)
   d) \( y = 8^{-x} \)

15) Make a rough sketch of the graph of the function \( y = 1 - \frac{1}{2}e^{-x} \). Do not use a calculator. Just use the graphs given in Figures 3 and 13 and, if necessary, the transformations of Section 1.3.

17) Starting with the graph of \( y = e^x \), write the equation of the graph that results from
   a) shifting 2 units downward
   b) shifting 2 units to the right
   c) reflecting about the \( x \)-axis
   d) reflecting about the \( y \)-axis
   e) reflecting about the \( x \)-axis and then about the \( y \)-axis