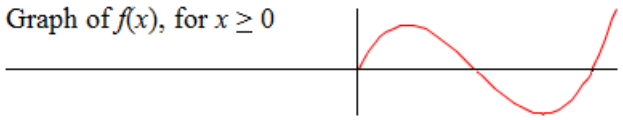
#s 1 – 3: Graph the function, by hand, by transforming a basic function.

1. $y=\frac{1}{2}(1-\cos(x))$

2. $y=1-2x-x^2$

3. $y=\left|\sqrt{x}-1\right|$

4. The graph of $f(x)$ is given, for $x \geq 0$.



   a. Explain how the graph of $f(|x|)$ is obtained from the graph of $f(x)$. Supply the graph of $f(|x|)$. Is $f(|x|)$ even, odd, or neither?

   b. If $f(x)=\sin(x)$, what is $f(|x|)$? Give me a sketch of $f(|x|)$.

   c. If $f(x)=\sqrt{x}$, what is $f(|x|)$? Give me a sketch of $f(|x|)$.

5. Given $f(x)=x^3+2x^2$ and $g(x)=3x^2-1$, find – and simplify – the following functions, and state the domain of each.

   a. $(f+g)(x)$ b. $(f-g)(x)$ c. $(fg)(x)$ d. $\left(\frac{f}{g}\right)(x)$

In the following exercises, find (a) $(f\circ g)(x)$, (b) $(g\circ f)(x)$, (c) $(f\circ f)(x)$, and (d) $(g\circ g)(x)$. State the domain of each function.

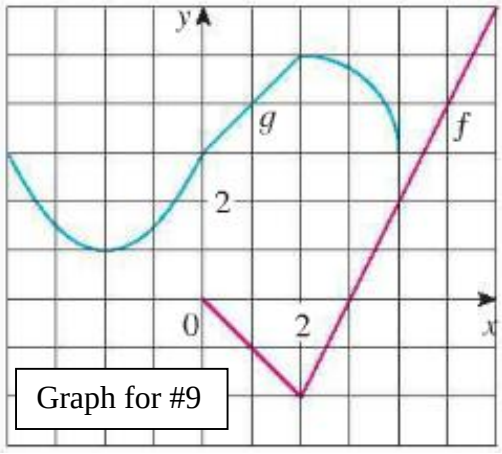
6. $f(x)=x^2-1,\ g(x)=2x+1$

7. $f(x)=x+\frac{1}{x},\ g(x)=\frac{x+1}{x+2}$

8. Express $F(x)=\frac{\sqrt[3]{x}}{\sqrt[3]{x}+1}$ as a composition $(f\circ g)(x)$.

9. Use the given graph of f and g to evaluate the following, if possible. If not possible, state why.

   (a) $f(g(2))$ (b) $g(f(0))$ (c) $(f\circ g)(0)$
   (d) $(g\circ f)(6)$ (e) $(g\circ g)(-2)$ (f) $(f\circ f)(4)$



Graph for #9

10. A spherical balloon is being inflated. Its radius is increasing at a rate of 2 cm/s.

    a. Express the radius, *r*, as a function of time, *t*, where t is measured in seconds.

    b. Find volume, *V*, as a function of time, *t*. This is a little different wording than the book's wording, which is why my solution looks weird.