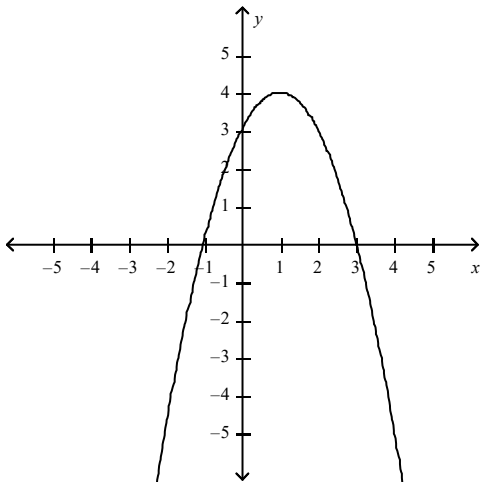
Stewart_Calc_7ET ch01sec03

MULTIPLE CHOICE

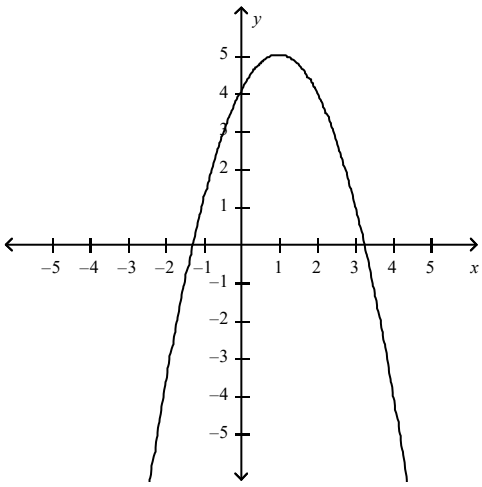
1. Graph the function by hand, not by plotting points, but by starting with the graph of one of the standard functions and then applying the appropriate transformations.

$y = 4 + 2x - x^2$

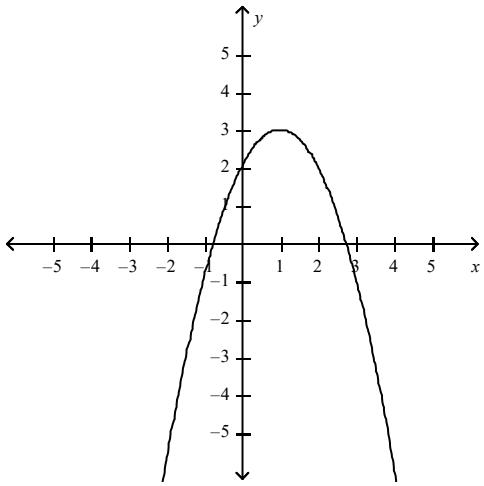
a.



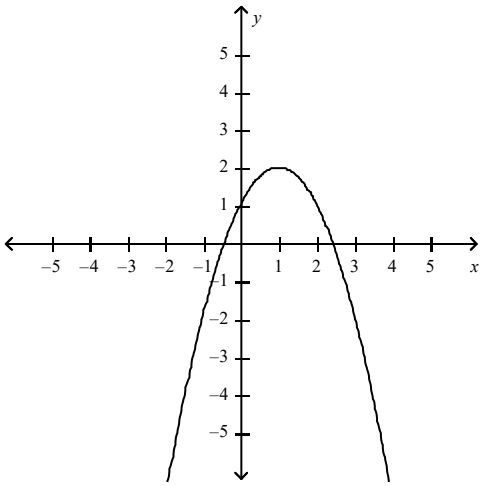
c.



b.



d.



ANS: C PTS: 1 DIF: Medium REF: 1.3.12
MSC: Bimodal NOT: Section 1.3

2. If $f(x) = x + 5$ and $h(x) = 4x - 10$, find a function g such that $g \circ f = h$.

a. $g(x) = 4x + 30$
b. $g(x) = 4x$
c. $g(x) = x - 30$
d. $g(x) = 4x - 30$
e. $g(x) = x + 30$

ANS: D PTS: 1 DIF: Medium REF: 1.3.61b
MSC: Bimodal NOT: Section 1.3

3. Use the table to evaluate the expression $(f \circ g)(6)$.

x	1	2	3	4	5	6
$f(x)$	3	2	1	0	1	2
$g(x)$	6	5	2	3	4	6

a. 5
b. 2
c. 3
d. 4
e. 6

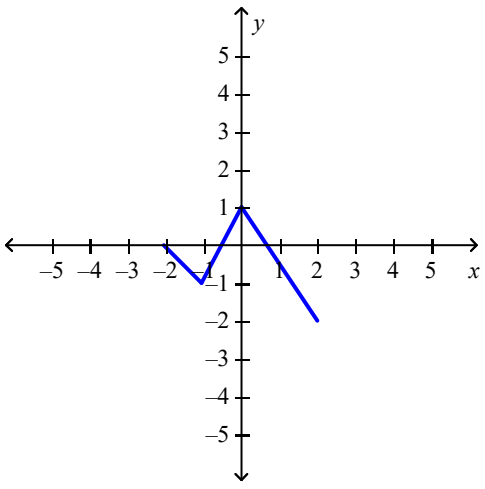
ANS: B PTS: 1 DIF: Medium REF: 1.3.50f
MSC: Bimodal NOT: Section 1.3

4. What is $\sqrt[10]{x}$, given that $H = f \circ g \circ h$ and $H(x) = \sqrt[10]{\sqrt{x} - 3}$?

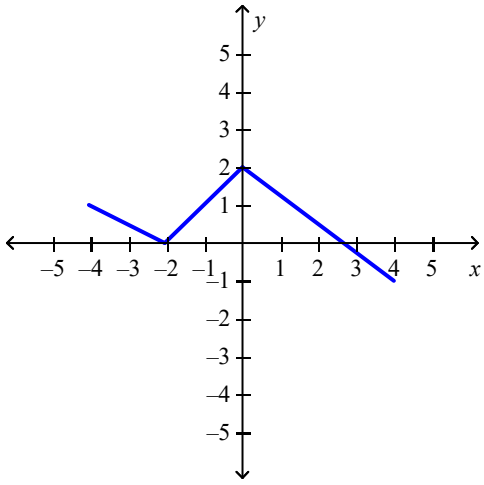
a. *h(x)*
b. *g(x)*
c. *f(x)*

ANS: C PTS: 1 DIF: Medium REF: 1.3.47
MSC: Bimodal NOT: Section 1.3

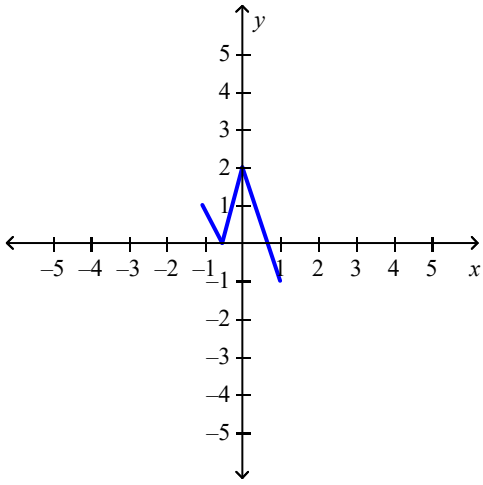
5. The graph of the function f follows. Choose the graph of $y = f\left(\frac{x}{2}\right) + 1$.



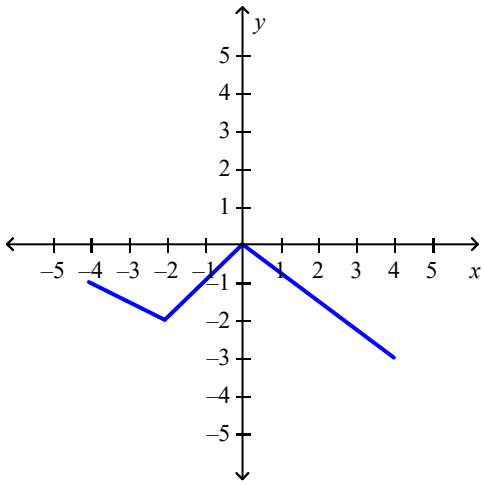
a. c.

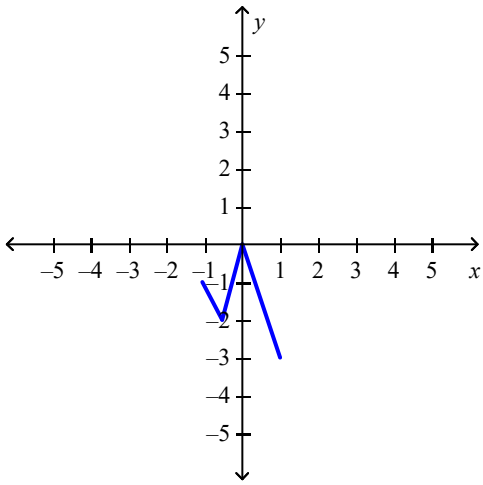


b.



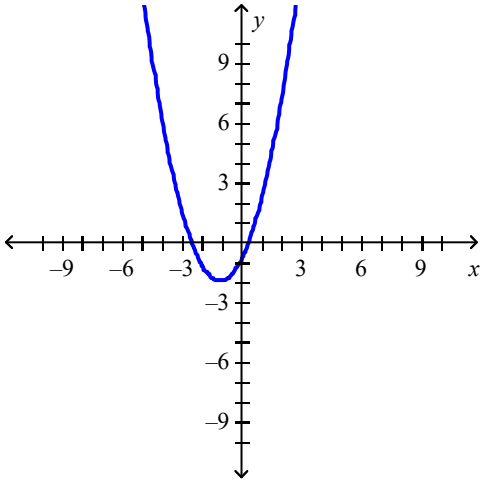
d.





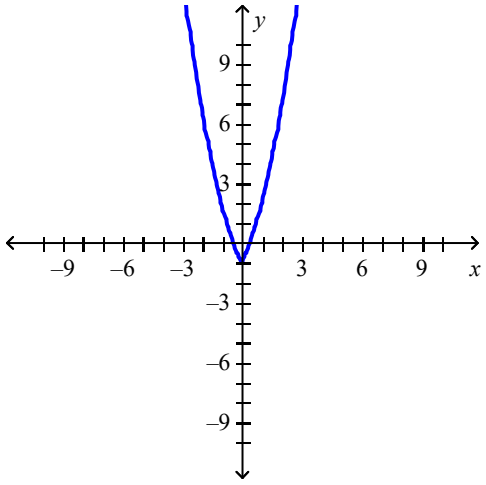
ANS: A PTS: 1 DIF: Medium REF: 1.3.5b
MSC: Bimodal NOT: Section 1.3

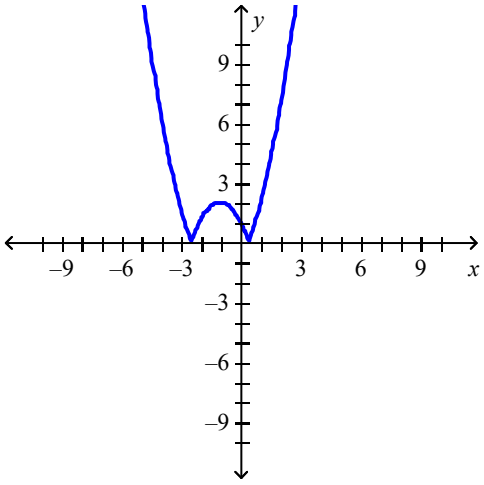
6. The graph of the function f follows. Choose the graph of $y = f(|x|)$.



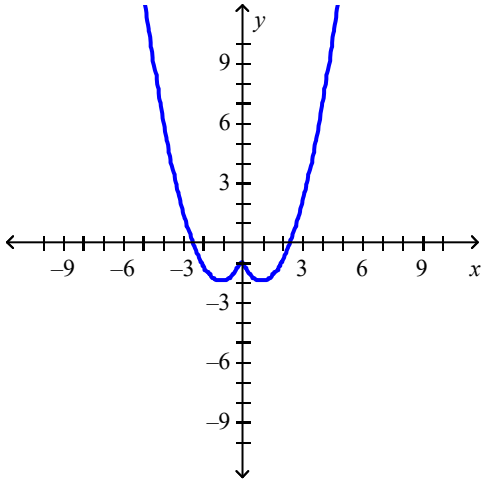
a.

c.

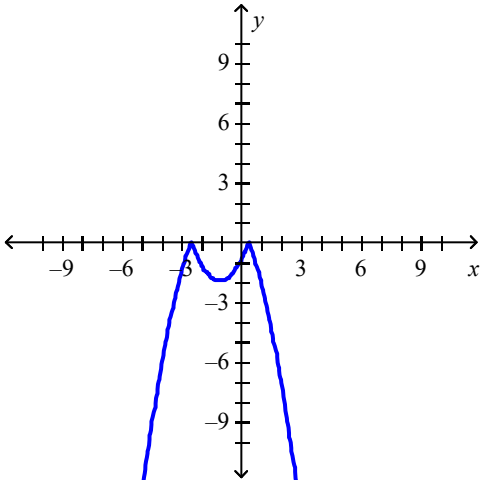




b.



d.



ANS: A PTS: 1 DIF: Medium REF: 1.3.5c
MSC: Bimodal NOT: Section 1.3

7. Suppose that the graph of is given f is given. Describe how the graph of the function $y = f(x-5)-5$ can be obtained from the graph of f.

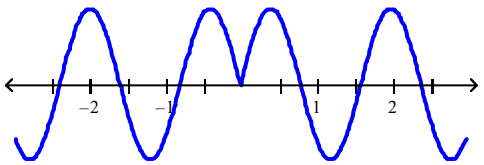
   a. Shift the graph 5 units to the left and 5 units down.
   b. Shift the graph 5 units to the left and 5 units up.
   c. Shift the graph 5 units to the right and 5 units up.
   d. Shift the graph 5 units to the right and 5 units down.
   e. None of these

   ANS: D PTS: 1 DIF: Medium REF: 1.3.1bc
   MSC: Bimodal NOT: Section 1.3

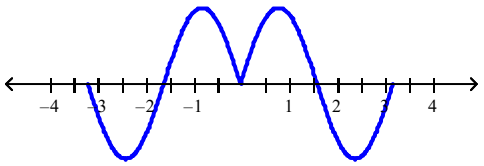
8. Which of the following graphs is the graph of the function?

   $f(x) = \sin|2x|$

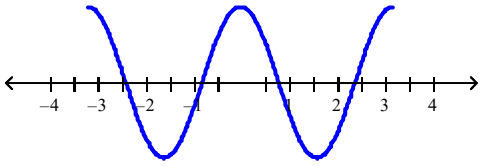
Graph 1



Graph 2



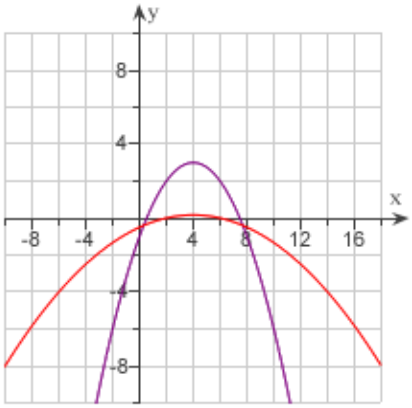
Graph 3



a. Graph 2
b. Graph 1
c. Graph 3

ANS: A PTS: 1 DIF: Medium REF: 1.3.24
MSC: Bimodal NOT: Section 1.3

9. Which of the following is the equation for the function $g(x)$?



a. $g(x) = -f(x) + 6$

b. $g(x) = 6f(x)$
c. $g(x) = f(x) - 6$

d. $g(x) = \dfrac{f(x)}{6}$

e. $g(x) = -f(x+6)$

ANS: D PTS: 1 DIF: Medium REF: 1.3.3c
MSC: Bimodal NOT: Section 1.3

NUMERIC RESPONSE

1. Express the function in the form of $f \circ g \circ h$.

   $H(x) = 2 - 4^{x^3}$

   ANS: $h(x) = x^3, g(x) = 4^x, f(x) = 2 - x$

   PTS: 1 DIF: Medium REF: 1.3.48
   MSC: Numerical Response NOT: Section 1.3

2. A spherical balloon with radius r inches has volume $4\dfrac{\pi r^3}{3}$.
   Find a function that represents the amount of air required to inflate the balloon from a radius of r inches to a radius of $r+3$ inches.

   ANS: $12\pi\left(r^2 + 3r + 3\right)$

   PTS: 1 DIF: Medium REF: 1.3.54
   MSC: Numerical Response NOT: Section 1.3

3. Express the function in the form of $f \circ g$.

   $v(t) = \sec\left(t^4\right)\tan\left(t^4\right)$

   _____

   ANS: $f(t) = \sec(t)\tan(t)$
   $g(t) = t^4$

   PTS: 1 DIF: Medium REF: 1.3.45

MSC: Numerical Response NOT: Section 1.3

4. A stone is dropped into a lake, creating a circular ripple that travels outward at a speed of 45 cm/s. Express the radius r of this circle as a function of the time t (in seconds) and find $A \circ r$, if A is the area of this circle as a function of the radius.

   ANS: $r(t) = 45t,\ 2025\pi t^2$

   PTS: 1 DIF: Medium REF: 1.3.53a
   MSC: Numerical Response NOT: Section 1.3

SHORT ANSWER

1. Let $f(x) = x^2 - 6x + 5$ and $g(x) = \sqrt{x+5}$. Find $(g \circ g)(20)$.

   ANS:
   $\sqrt{10}$

   PTS: 1 DIF: Easy REF: 1.3.36 MSC: Short Answer
   NOT: Section 1.3

2. Find $f \circ g \circ h$ if
   $f(x) = \dfrac{1}{x}, \quad g(x) = 2x^2 + 7, \quad \text{and} \quad h(x) = \cos x$

   ANS:
   $\dfrac{1}{2\cos^2 x + 7}$

   PTS: 1 DIF: Medium REF: 1.3.37 MSC: Short Answer
   NOT: Section 1.3