Classroom Voting Questions: Precalculus

1.3 New Functions From Old

1. The functions f and g have values given in the table below. What is the value of $f(g(0))$?

x	-2	-1	0	1	2
$f(x)$	1	0	-2	2	-1
$g(x)$	-1	1	2	0	-2

   (a) -2

   (b) -1

   (c) 0

   (d) 1

   (e) 2

2. The functions f and g have values given in the table below. If $f(g(x)) = 1$, then what is x?

x	-2	-1	0	1	2
$f(x)$	1	0	-2	2	-1
$g(x)$	-1	1	2	0	-2

   (a) -2

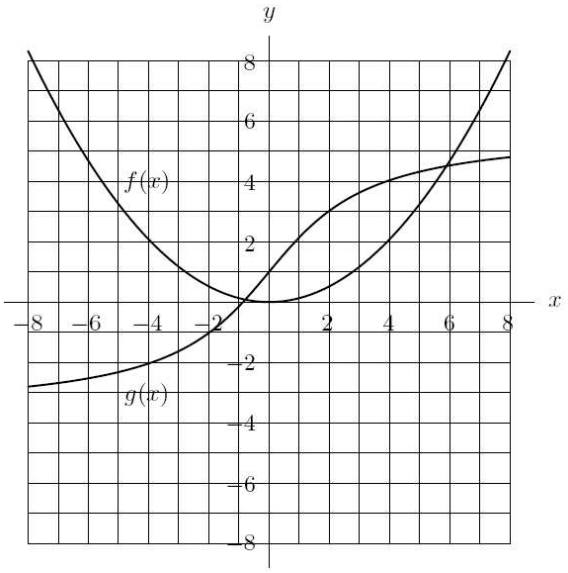
   (b) -1

   (c) 0

   (d) 1

   (e) 2

3. The graphs of f and g are shown in the figure below. Estimate the value of $g(f(3))$.



(a) -1

(b) 0

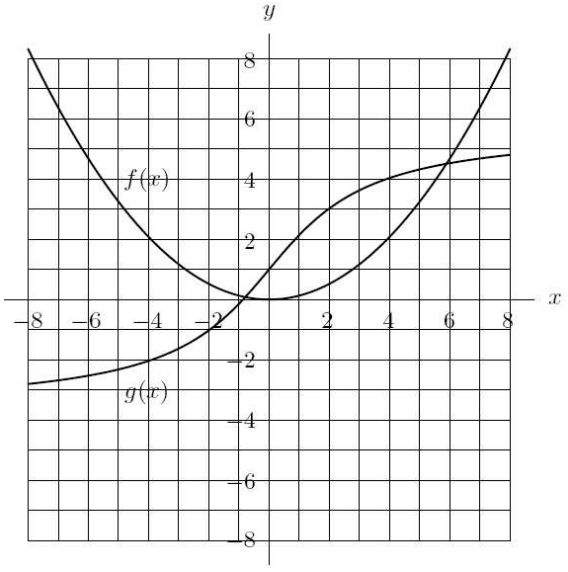
(c) 1

(d) 2

(e) 3

(f) 5

4. The graphs of f and g are shown in the figure below. Estimate the value of $f(g(2))$.



(a) -1

(b) 0

(c) 1

(d) 2

(e) 3

(f) 5

5. If $P = f(t) = 3 + 4t$, find $f^{-1}(P)$.

   (a) $f^{-1}(P) = 3 + 4P$

   (b) $f^{-1}(P) = \frac{P-3}{4}$

   (c) $f^{-1}(P) = \frac{P-4}{3}$

   (d) $f^{-1}(P) = 4(P + 3)$

   (e) $f^{-1}(P) = \frac{P+3}{4}$

6. A function is given in Figure 1.10 below. Which one of the other graphs could be a graph of $f(x + h)$?

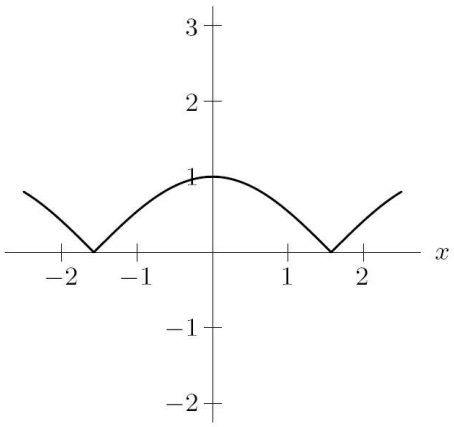
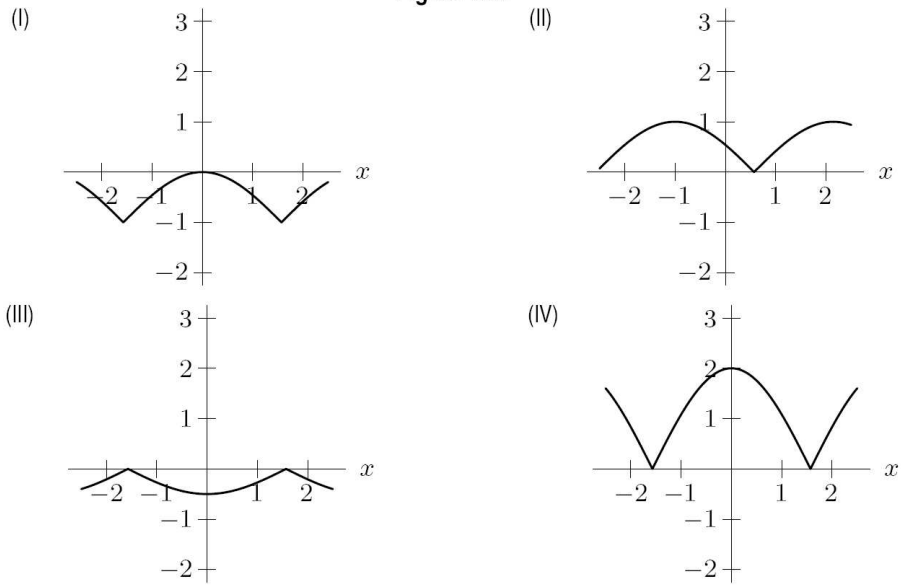


Figure 1.10



(a) I

(b) II

(c) III

(d) IV

7. The function $f(x)$ goes through the point A with coordinates (2,3). $g(x) = 2f(\frac{1}{3}x - 2) + 4$. What are the coordinates of point A in the function $g(x)$?

(a) $(4, 10)$

(b) $(4, -\frac{5}{2})$

(c) $(12, 10)$

(d) $(-\frac{4}{3}, 10)$

(e) $(-\frac{4}{3}, -\frac{5}{2})$

8. Take the function $f(x)$ and "Shift the function right h units. Reflect the result across the y-axis, then reflect the result across the x-axis. Final shift the result up k units." The end result is:

   (a) $f(x+h)+k$
   (b) $f(x-h)+k$
   (c) $-f(-x-h)+k$
   (d) $-f(-x+h)+k$

9. Given $f(x)=x+1$ and $g(x)=3x^2-2x$, what is the composition $g(f(x))$.

   (a) $3x^2-2x+1$
   (b) $(3x^2-2x)(x+1)$
   (c) $3x^2+4x+1$
   (d) $3(x+1)^2-2x$

10. Write $h(x)=e^{3x/2}$ as a composition of functions: $f(g(x))$. $f(x)=$ _____, $g(x)=$ _____.

    (a) $e^x, 3x/2$
    (b) $3x/2, e^x$
    (c) $x, e^{3x/2}$
    (d) $x/2, 3e^x$

11. Which of the following functions IS invertible?

    (a) $f(x)=-x^4+7$
    (b) $g(x)=e^{3x/2}$
    (c) $h(x)=\cos(x)$
    (d) $k(x)=|x|$