1. Find the inverse function of *f* informally.

$f(x) = 6x$

a. $f^{-1}(x) = 6 - x$
· $f^{-1}(x) = 6 + x$
c. $f^{-1}(x) = \frac{1}{6}x$
d. $f^{-1}(x) = x - 6$
e. $f^{-1}(x) = \frac{6}{x}$

2. Find the inverse function of *f* informally.

$f(x) = x - 5$

a. $f^{-1}(x) = -(x + 5)$
b. $f^{-1}(x) = \frac{5}{x}$
c. $f^{-1}(x) = \frac{x}{5}$
d. $f^{-1}(x) = 5 - x$
e. $f^{-1}(x) = x + 5$

3. Find the inverse function of *f* informally.

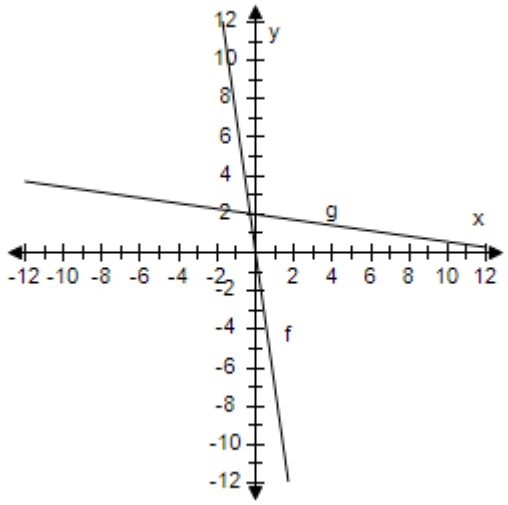
$f(x) = x^8$

a. $f^{-1}(x) = \sqrt[8]{x}$
b. $f^{-1}(x) = \sqrt[8]{x}$
c. $f^{-1}(x) = \frac{1}{\sqrt[8]{x}}$
d. $f^{-1}(x) = \left(\sqrt[8]{x}\right)^8$
e. $f^{-1}(x) = -\sqrt[8]{x}$

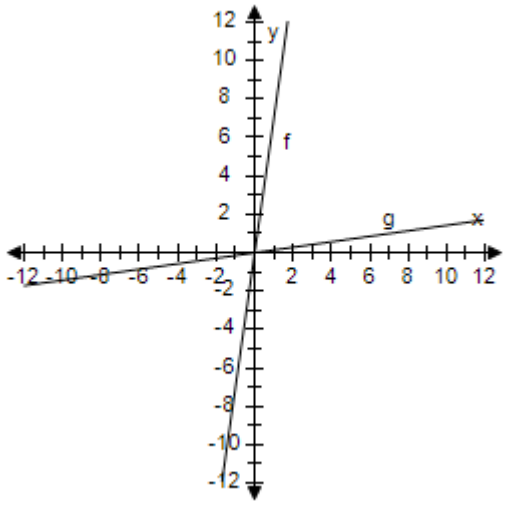
4. Select the correct graph showing that *f* and *g* are inverse functions.

$f(x) = 7x, g(x) = \frac{x}{7}$

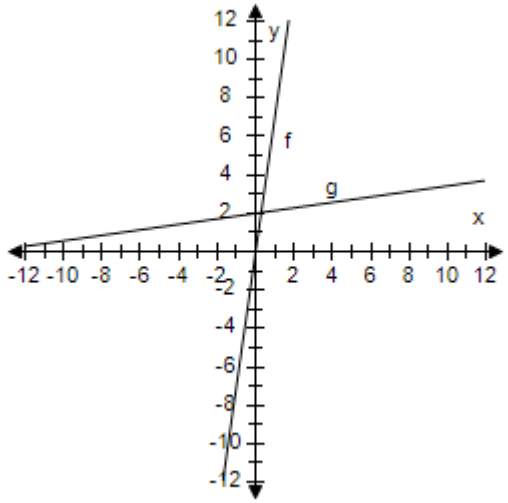
a.



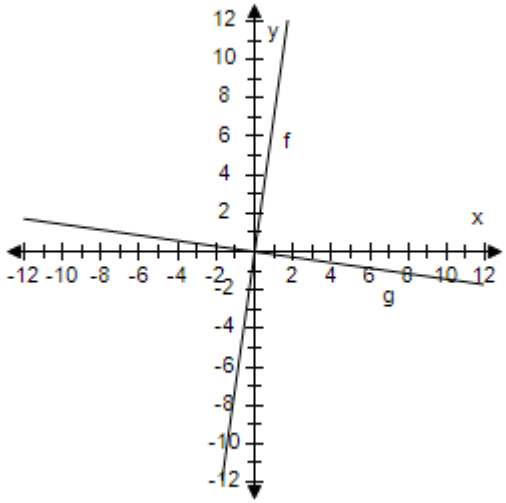
b.



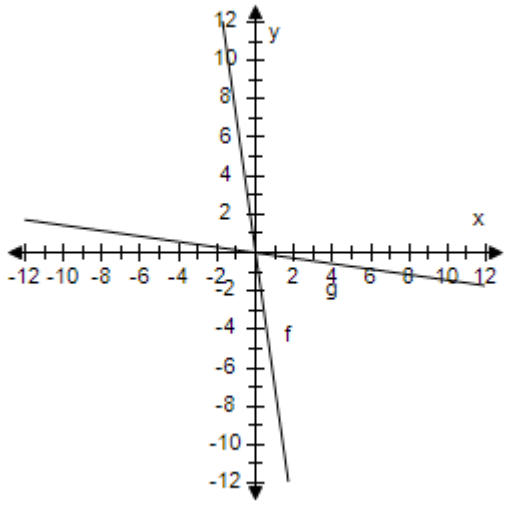
c.



d.



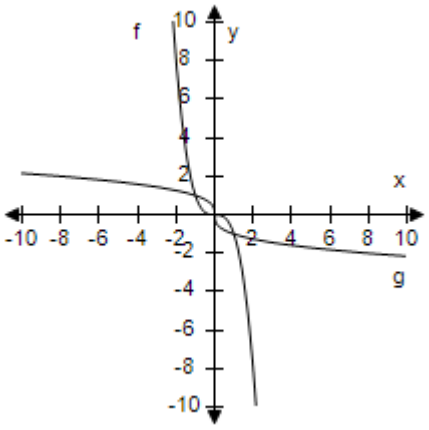
e.



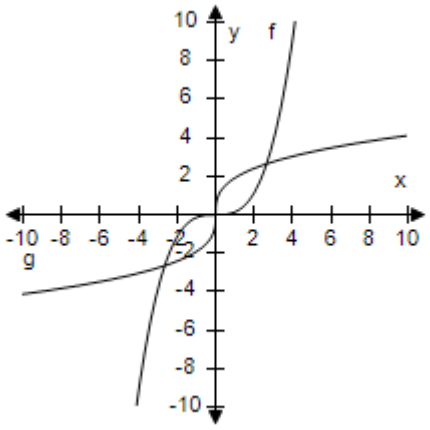
5. Select the correct graph showing that *f* and *g* are inverse functions.

$$f(x) = \frac{x^3}{7}, g(x) = \sqrt[3]{7x}$$

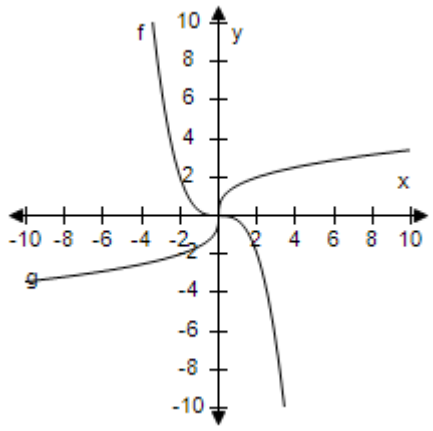
a.



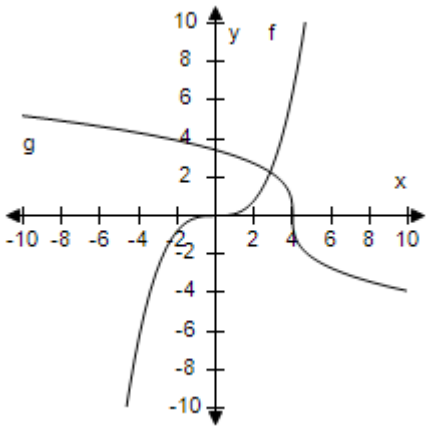
b.



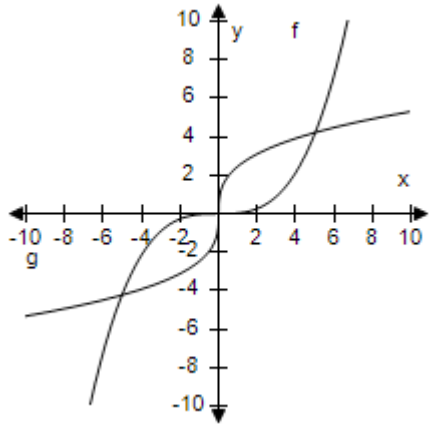
c.



d.



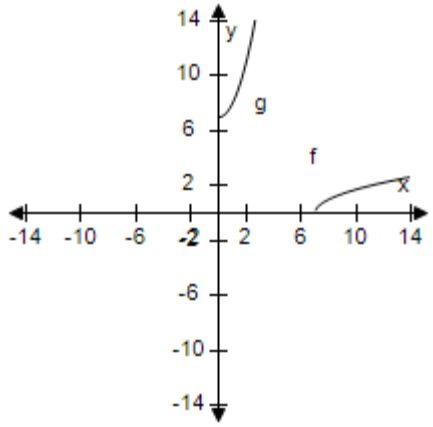
e.



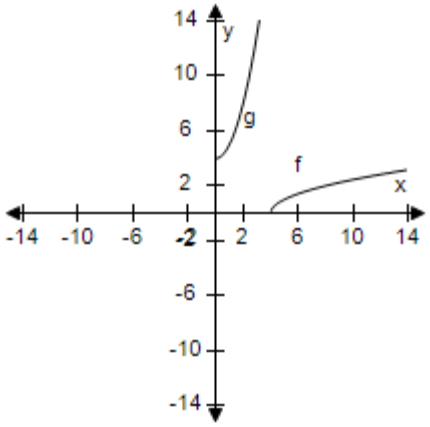
6. Select the correct graph, showing *f* and *g* are inverse functions.

$f(x) = \sqrt{x-2}, g(x) = x^2 + 2, x \geq 0$

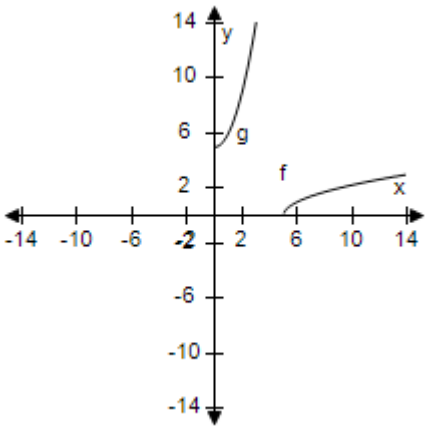
a.



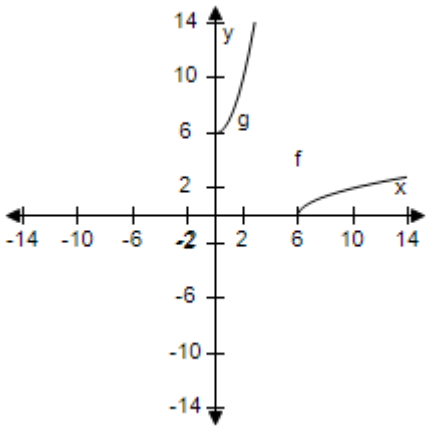
b.



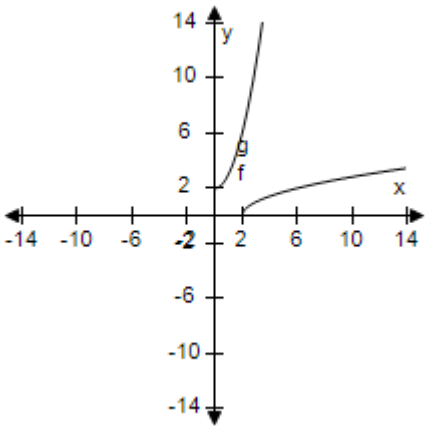
c.



d.



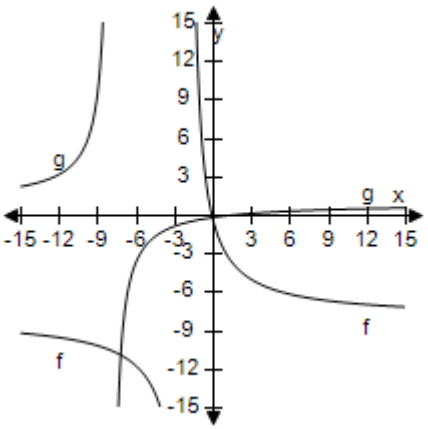
e.



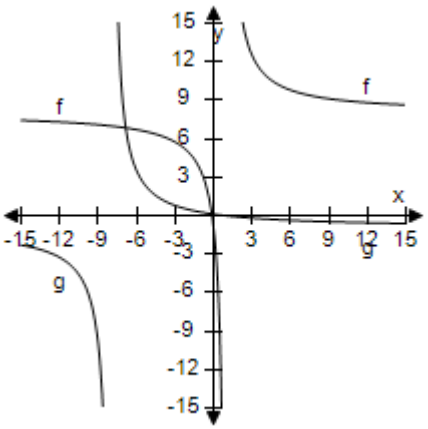
7. Select the correct graph showing that *f* and *g* are inverse functions.

$$f(x) = \frac{x-1}{x+8}, g(x) = -\frac{8x+1}{x-1}$$

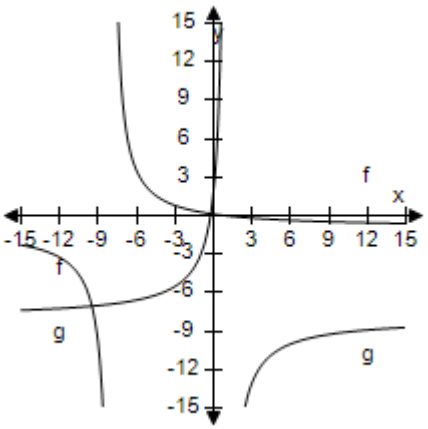
a.



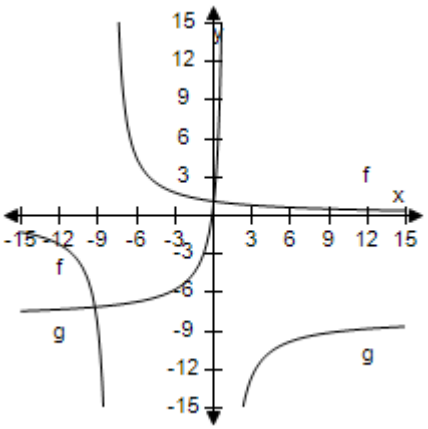
b.



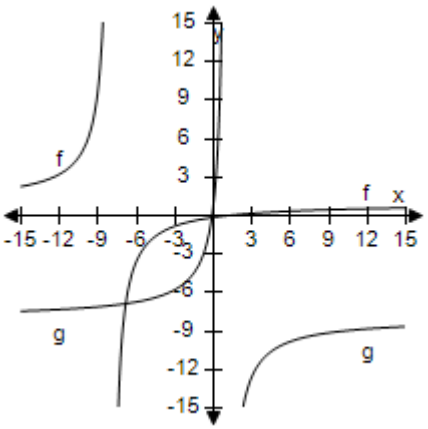
c.



d.



e.



8. Use the tables of values for $y = f(x)$ to complete a table for $y = f^{-1}(x)$.

x	–3	–2	0	1	2	3
$f(x)$	–4	–2	2	4	6	8

a.

x	–4	–2	2	4	6	8
$f^{-1}(x)$	–3	–2	0	1	8	3

b.

x	–4	–2	2	4	6	6
$f^{-1}(x)$	–2	–2	0	1	2	3

c.

x	–4	–2	2	4	6	8
$f^{-1}(x)$	–3	0	1	1	8	3

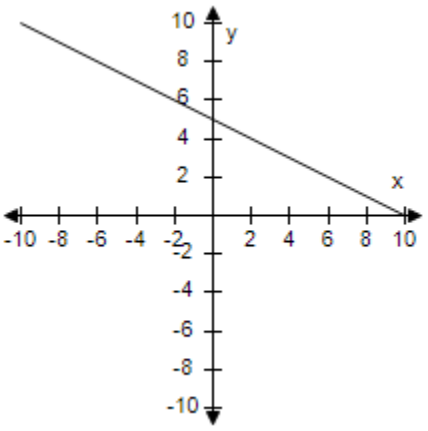
d.

x	–4	–2	2	4	6	8
$f^{-1}(x)$	–3	–2	0	6	2	3

e.

x	–4	–2	2	4	6	8
$f^{-1}(x)$	–3	–2	0	1	2	3

9. Does the function have an inverse function?



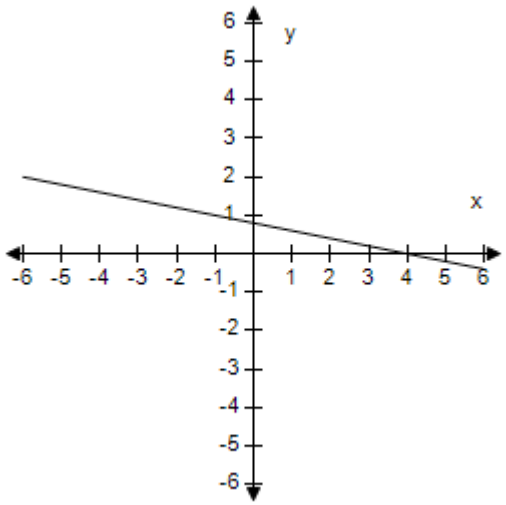
a. No

b. Yes

10. Select the graph of the function and use the Horizontal Line Test to determine whether the function is one-to-one and so has an inverse function.

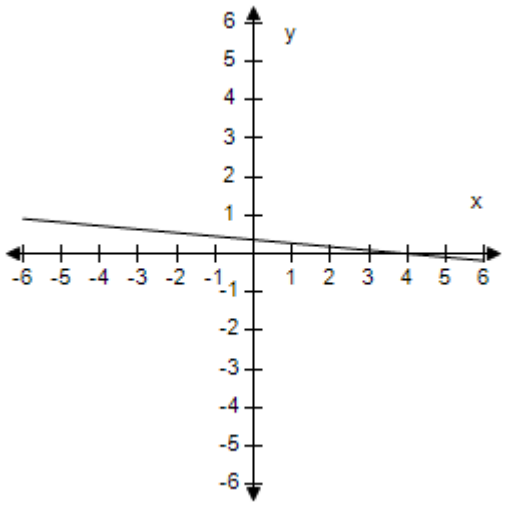
$$g(x) = \frac{4 - x}{5}$$

a.



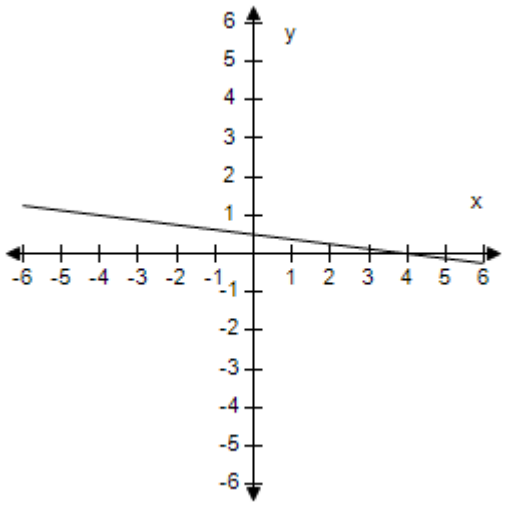
The function has an inverse.

b.



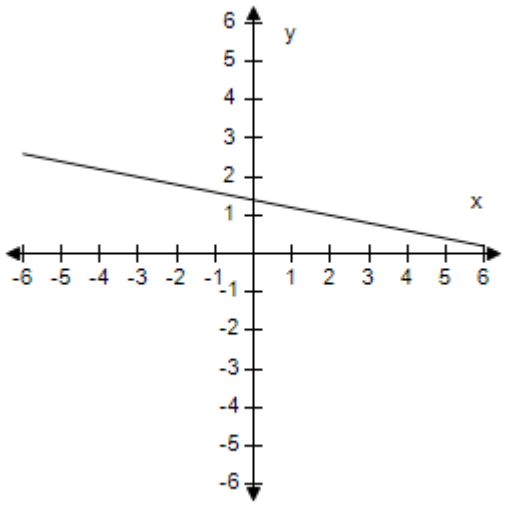
The function has an inverse.

c.



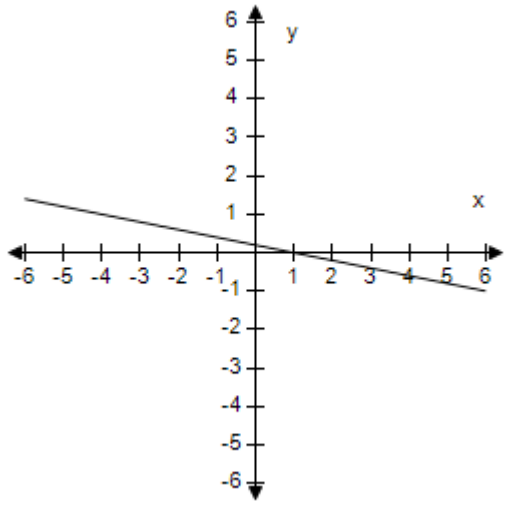
The function has an inverse.

d.



The function has an inverse.

e.

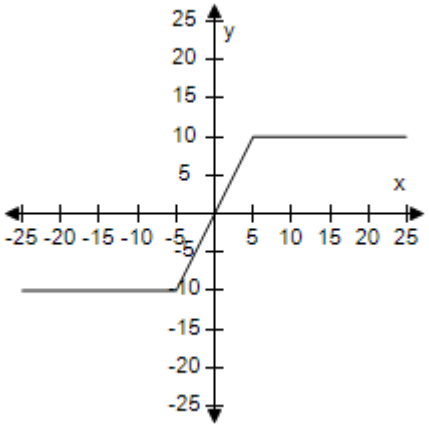


The function has an inverse.

11. Select the graph of the function and use the Horizontal Line Test to determine whether the function is one-to-one and so has an an inverse function.

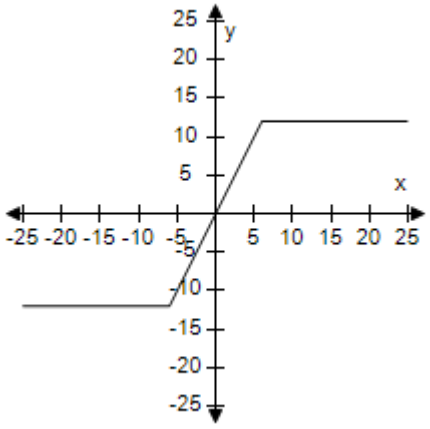
$g(x) = |x + 4| - |x - 4|$

a.



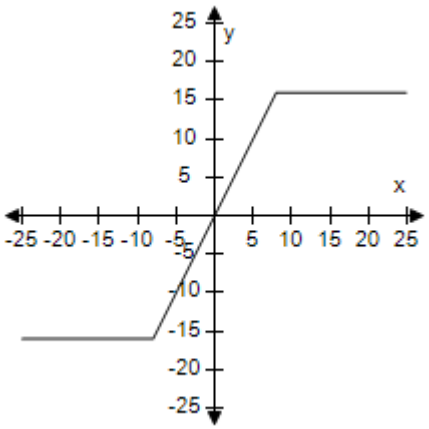
The function does not have inverse.

b.



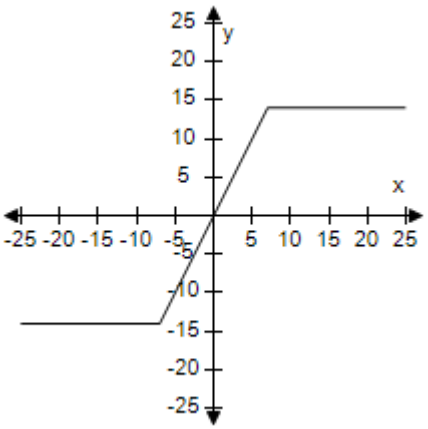
The function does not have inverse.

c.



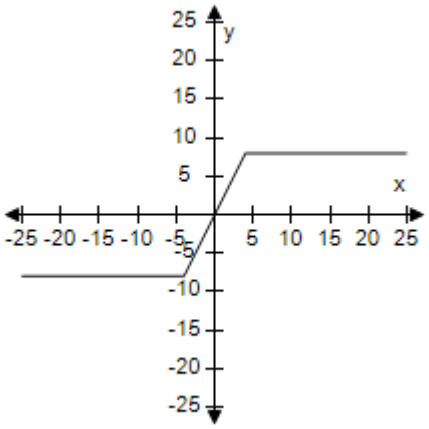
The function does not have inverse.

d.



The function does not have inverse.

e.



The function does not have inverse.

12. Find the inverse function of $g(x) = x^4 - 5$ informally.

a. $g^{-1}(x) = \sqrt[4]{x - 5}$

b. $g^{-1}(x) = (x + 5)^4$

c. $g^{-1}(x) = x^4 + 5$

d. $g^{-1}(x) = \sqrt[4]{x + 5}$

e. $g^{-1}(x) = (x - 5)^4$

13. Find the inverse function of $f(x) = \sqrt{36 - x^2}, 0 \le x \le 6$.

a. $f^{-1}(x) = \sqrt{36 - x^2}, 0 \le x \le 6$

b. $f^{-1}(x) = \sqrt{x^2 - 36}, 0 \le x \le 6$

c. $f^{-1}(x) = 36 - x^2, 0 \le x \le 6$

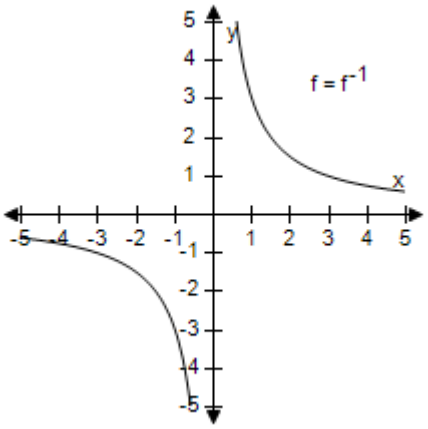
d. $f^{-1}(x) = \sqrt{36 + x^2}, 0 \le x \le 6$

e. $f^{-1}(x) = 36 + x^2, 0 \le x \le 6$

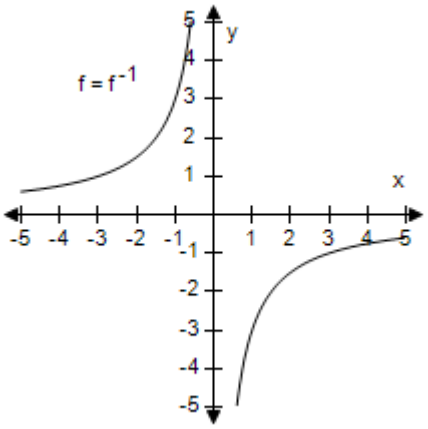
14. Select the graphs of f and f^{-1} on the same set of coordinate axes.

$$f(x) = \frac{3}{x}$$

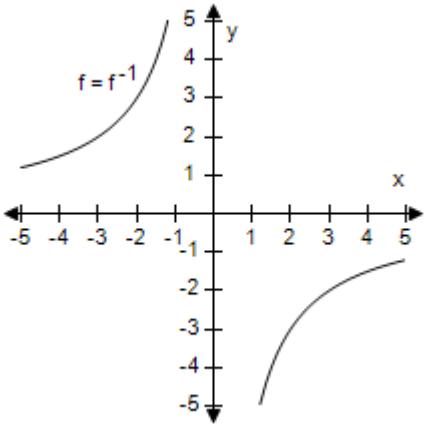
a.



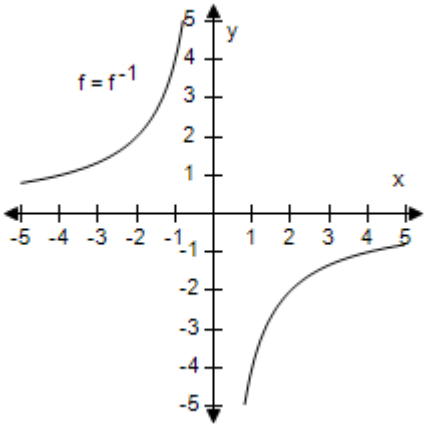
b.



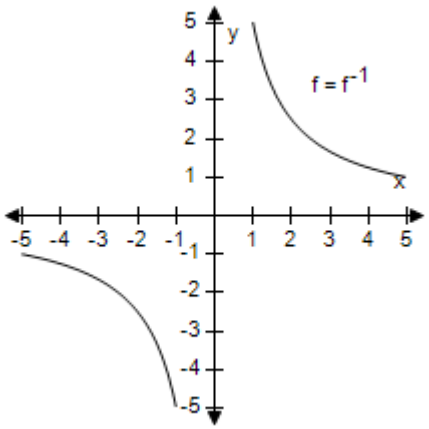
c.



d.



e.



15. Determine whether the function has an inverse function. If it does, find the inverse function.

$g(x) = x^7$

a. $g^{-1}(x) = \frac{7}{x}$

b. $g^{-1}(x) = -7x$

c. $g^{-1}(x) = -\frac{x}{7}$

d. $g^{-1}(x) = 7x$

e. The inverse exists, but none of the above

16. Determine whether the function has an inverse function. If it does, find the inverse function.

$g(x) = \frac{x}{5}$

a. $g^{-1}(x) = -5x$

b. $g^{-1}(x) = 5x$

c. $g^{-1}(x) = \frac{5}{x}$

d. $g^{-1}(x) = -\frac{x}{5}$

e. No inverse

17. Determine whether the function has an inverse function. If it does, find the inverse function.

$f(x) = (x + 4)^2, x \geq -4$

a. $f^{-1}(x) = \sqrt{x} + 4$

b. $f^{-1}(x) = -(x + 4)^2$

c. $f^{-1}(x) = (x + 4)^{-2}$

d. $f^{-1}(x) = \sqrt{x} - 4$

e. No inverse

18. Determine whether the function has an inverse function. If it does, find the inverse function.

$$f(x) = \begin{cases} x + 5, x < 0 \\ 2 - x, x \geq 0 \end{cases}$$

a. $f^{-1}(x) = \begin{cases} 5 + x, x \geq 0 \\ x - 2, x < 0 \end{cases}$

b. $f^{-1}(x) = \begin{cases} 2 + x, x \geq 0 \\ x - 5, x < 0 \end{cases}$

c. $f^{-1}(x) = \begin{cases} x - 5, x \geq 0 \\ 2 + x, x < 0 \end{cases}$

d. $f^{-1}(x) = \begin{cases} x + 5, x \geq 0 \\ 2 - x, x < 0 \end{cases}$

e. No inverse

19. Determine whether the function has an inverse function. If it does, find the inverse function.

$f(x) = \sqrt{8x + 5}$

a. $f^{-1}(x) = -\dfrac{x^2 + 5}{8}, x \geq 0$

b. $f^{-1}(x) = -\dfrac{x^2 - 5}{8}, x \geq 0$

c. $f^{-1}(x) = \dfrac{x^2 - 5}{8}, x \geq 0$

d. $f^{-1}(x) = \dfrac{x^2 + 5}{8}$, $x \geq 0$

e. No inverse

20. Restrict the domain of the function f so that the function is one-to-one and has an inverse function. Then find the inverse function f^{-1}. State the domains and ranges of f and f^{-1}.

$f(x) = (x - 5)^2$

a. $f^{-1}(x) = \sqrt{x} - 5$

The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 5$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \geq 0$.

b. $f^{-1}(x) = \sqrt{x} + 5$

The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 0$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \geq -5$.

c. $f^{-1}(x) = \sqrt{x} + 5$

The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 5$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \geq 0$.

d. $f^{-1}(x) = \sqrt{x} + 5$

The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 0$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \geq 5$.

e. $f^{-1}(x) = \sqrt{x} - 5$

The domain of f and the range of f^{-1} are all real numbers x such that $x \geq -5$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \geq 0$.

21. Restrict the domain of the function f so that the function is one-to-one and has an inverse function. Then find the inverse function f^{-1}. State the domains and ranges of f and f^{-1}.

$f(x) = -4x^2 + 6$

a. $f^{-1}(x) = \dfrac{\sqrt{-(x - 6)}}{2}$

The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 0$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \leq 6$.

b. $f^{-1}(x) = \dfrac{\sqrt{-6(x-4)}}{6}$

The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 0$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \leq 6$.

c. $f^{-1}(x) = \dfrac{\sqrt{-(x-6)}}{-2}$

The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 0$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \leq 6$.

d. $f^{-1}(x) = \dfrac{\sqrt{-(x-6)}}{2}$

The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 0$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \leq -6$.

e. $f^{-1}(x) = \dfrac{\sqrt{-(x+6)}}{2}$

The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 0$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \leq 6$.

22. Restrict the domain of the function f so that the function is one-to-one and has an inverse function. Then find the inverse function f^{-1}. State the domains and ranges of f and f^{-1}.

$f(x) = |x - 9| + 1$

a. $f^{-1}(x) = x + 8$
The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 9$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \geq 1$.

b. $f^{-1}(x) = x - 8$
The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 9$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \geq 1$.

c. $f^{-1}(x) = -x - 8$
The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 1$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \geq -9$.

d. $f^{-1}(x) = x + 8$

The domain of f and the range of f^{-1} are all real numbers x such that $x \geq -9$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \geq 1$.

e. $f^{-1}(x) = -x + 8$
The domain of f and the range of f^{-1} are all real numbers x such that $x \geq 1$.
The domain of f^{-1} and the range of f are all real numbers x such that $x \geq 9$.

23. Use the functions given by $f(x) = \frac{1}{8}x - 1$ and $g(x) = x^3$ to find $(f^{-1} \circ g^{-1})(1)$.

a. 14
b. 12
c. 16
d. 20
e. 18

24. Use the functions given by $f(x) = \frac{1}{8}x - 5$ and $g(x) = x^3$ to find $(g^{-1} \circ f^{-1})(-5)$.

a. –2
b. 0
c. –4
d. 2
e. 4

25. Use the function given by $f(x) = \frac{1}{8}x - 5$ to find $(f^{-1} \circ f^{-1})(-5)$.

a. 36
b. 44
c. 40
d. 38
e. 42

26. Your wage is \$11.00 per hour plus \$0.50 for each unit produced per hour. So, your hourly wage in terms of the number of units produced x is $y = 11 + 0.50x$. Find the inverse function. What does each variable represent in the inverse function?

a. $y = \dfrac{x - 11}{0.50}$

x = hourly wage; y = number of units produced

b. $y = 11 + 0.50x$
x = hourly wage; y = number of units produced

c. $y = \dfrac{x + 11}{0.50}$

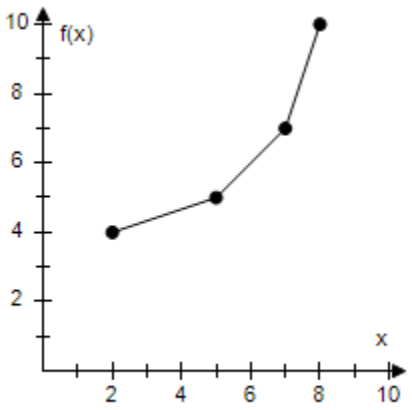
x = hourly wage; y = number of units produced

d. $y = \dfrac{11 - x}{0.50}$

x = hourly wage; y = number of units produced

e. $y = 11 - 0.50x$
x = hourly wage; y = number of units produced

27. Use the graph of the function f to create a table of values for the given points. Then create a second table that can be used to find f^{-1}.



a.

x	2	5	7	8
$f(x)$	4	5	7	10

x	4	5	7	10
$f^{-1}(x)$	2	5	7	8

b.

x	4	5	7	10
$f(x)$	2	5	7	8

x	2	5	7	8
$f^{-1}(x)$	4	5	7	10

c.

x	2	5	7	8
$f(x)$	4	5	7	10

x	4	5	7	10
$f^{-1}(x)$	–2	–5	–7	–8

d.

x	–4	–5	–7	–10
$f(x)$	2	5	7	8

x	2	5	7	8
$f^{-1}(x)$	4	5	7	10

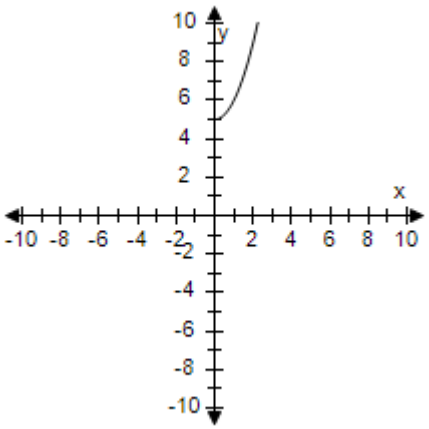
e.

x	–4	–5	–7	–10
$f(x)$	2	5	7	8

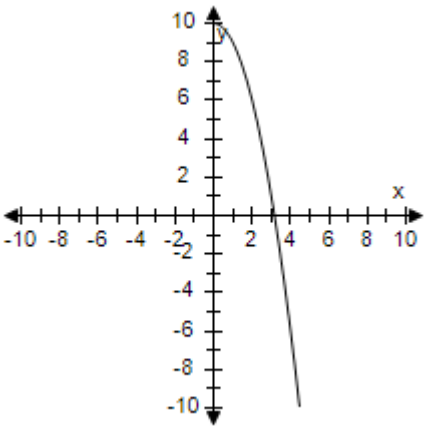
x	4	5	7	10
$f^{-1}(x)$	–2	–5	–7	–8

28. Restrict the domain of $f(x) = x^2 + 5$ to $x \geq 0$. Use a graphing utility to graph the function.

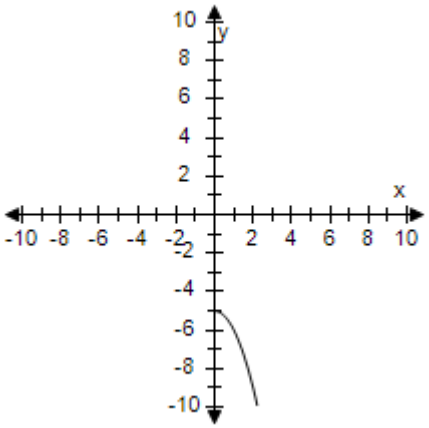
a.



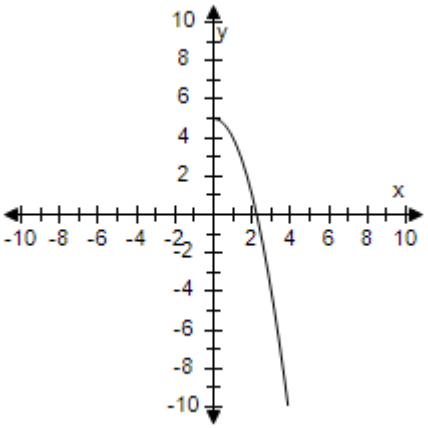
b.



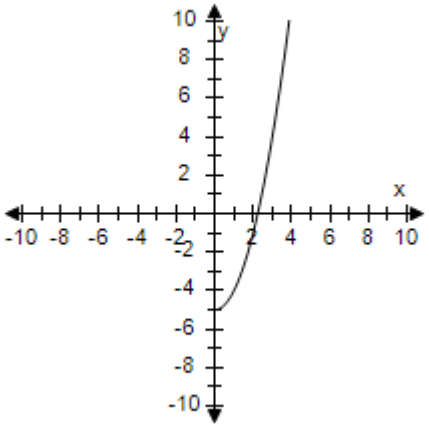
c.



d.



e.



29. Find the inverse function of *f*.
$f(x) = x^5 - 9$

a. $f^{-1}(x) = \sqrt[5]{x} + 9$

b. $f^{-1}(x) = \sqrt[5]{x} - 9$

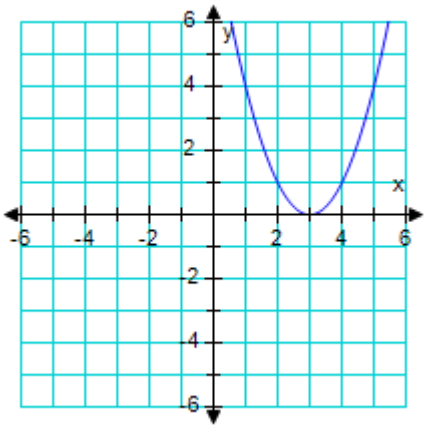
c. $f^{-1}(x) = -\sqrt[5]{x} - 9$

d. $f^{-1}(x) = -\sqrt[5]{x - 9}$

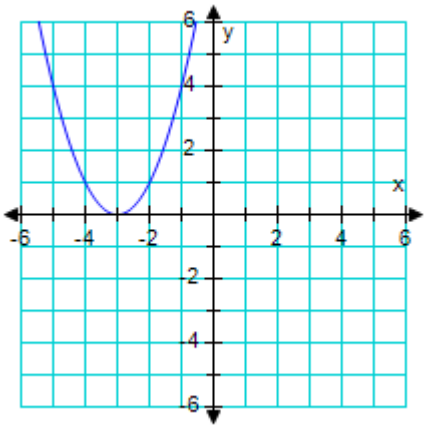
e. $f^{-1}(x) = \sqrt[5]{x + 9}$

30. Graph the given function.
$f(x) = (x + 3)^2$

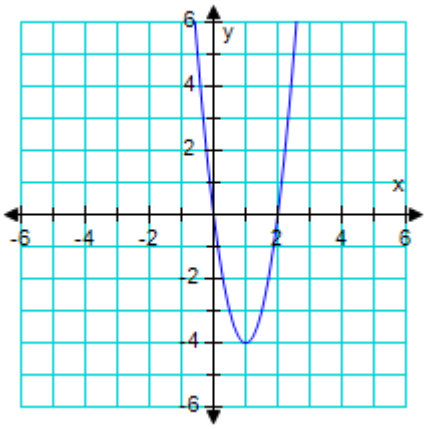
a.



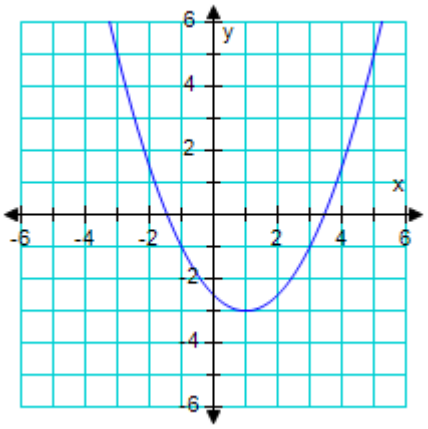
b.



c.



d.



e.