

Key

Inverse Relations

Find the inverse for each relation.

1. $\{(1, -3), (-2, 3), (5, 1), (6, 4)\}$ 2. $\{(-5, 7), (-6, -8), (1, -2), (10, 3)\}$

$\{(-3, 1), (3, -2), (1, 5), (4, 6)\}$ $\{(7, -5), (-8, -6), (-2, 1), (3, 10)\}$

Finding Inverses

Find an equation for the inverse for each of the following relations.

3. $y = 3x + 2$ 4. $y = -5x - 7$ 5. $y = 12x - 3$
 $f^{-1}(x) = \frac{x-2}{3} = \frac{1}{3}x - \frac{2}{3}$ $f^{-1}(x) = \frac{x+7}{-5} = -\frac{1}{5}x - \frac{7}{5}$ $f^{-1}(x) = \frac{x+3}{12} = \frac{1}{12}x + \frac{1}{4}$

6. $y = -8x + 16$ 7. $y = \frac{2}{3}x - 5$ 8. $y = -\frac{3}{4}x + 5$
 $f^{-1}(x) = \frac{x-16}{-8} = -\frac{1}{8}x + 2$ $f^{-1}(x) = \frac{3}{2}(x+5) = \frac{3}{2}x + \frac{15}{2}$ $f^{-1}(x) = -\frac{4}{3}(x-5) = -\frac{4}{3}x + \frac{20}{3}$

9. $y = -\frac{5}{8}x + 10$ 10. $y = \frac{1}{2}x + 8$ 11. $y = x^2 + 5$
 $f^{-1}(x) = 2(x-8) = 2x - 16$ $f^{-1}(x) = \pm\sqrt{x-5}$

12. $y = x^2 - 4$ 13. $y = (x+3)^2$ 14. $y = (x-6)^2$ $y = \pm\sqrt{x} + 6$
 $f^{-1}(x) = \pm\sqrt{x+4}$ $y = \pm\sqrt{x} - 3$

15. $y = \sqrt{x-2}$ 16. $y = \sqrt{x+5}$ 17. $y = \sqrt{x+8}$
 $f^{-1}(x) = x^2 + 2$ $f^{-1}(x) = x^2 - 5$ $f^{-1}(x) = (x-8)^2$

18. $y = \sqrt{x-7}$
 $f^{-1}(x) = (x+7)^2$

evens

Verifying Inverses

Verify that f and g are inverse functions.

19. $f(x) = x + 6, g(x) = x - 6$ 20. $f(x) = 5x + 2, g(x) = \frac{x-2}{5}$

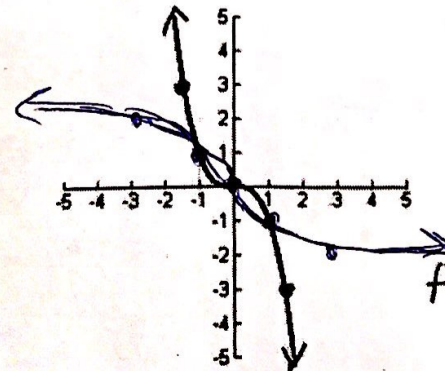
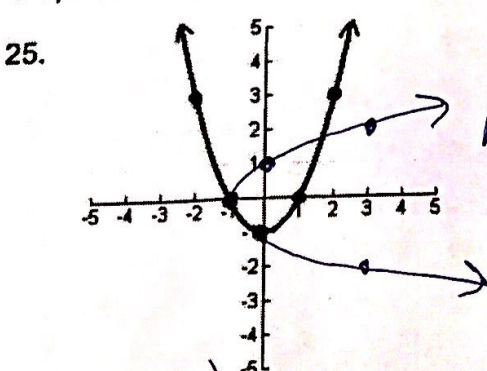
21. $f(x) = -3x - 9, g(x) = -\frac{1}{3}x - 3$ 22. $f(x) = 2x - 7, g(x) = \frac{x+7}{2}$

23. $f(x) = -4x + 8, g(x) = -\frac{1}{4}x + 2$ 24. $f(x) = \frac{1}{2}x - 7, g(x) = 2x + 14$

No

Graphing Inverses

Graph the inverse for each relation below (put your answer on the same graph).



$f(x)$ domain: $(-\infty, \infty)$
 $f(x)$ range: $[-1, \infty)$
 $f^{-1}(x)$ domain: $[-1, \infty)$
 $f^{-1}(x)$ range: $(-\infty, \infty)$

$f(x)$ domain: $(-\infty, \infty)$
 $f(x)$ range: $(-\infty, \infty)$
 $f^{-1}(x)$ domain: $(-\infty, \infty)$
 $f^{-1}(x)$ range: $(-\infty, \infty)$