

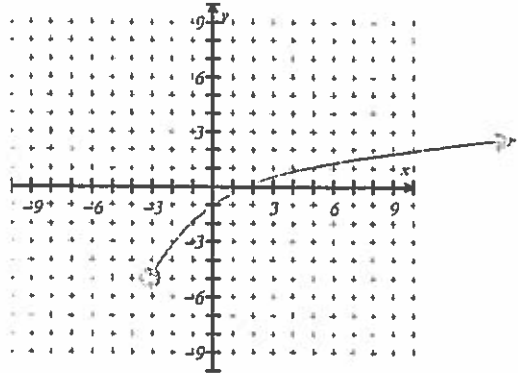
HOMWORK: INVERSES

NAME: _____ Day 11 Due: _____

Spiral review for everyone...

1. Find the domain: $[-3, \infty)$

2. Find the range: $[-5, \infty)$



3. Find the domain of $f(x) = \frac{3}{x-5}$

$\mathbb{R}, x \neq 5$

4. Find the domain of $f(x) = \sqrt{2x+3} + 0$
Initial Point: $(-3, 0)$

$[-3, \infty)$

CHOOSE 3 of the following to complete. Find the inverse!

5. $y = -12x + 7$

$$x = -\frac{12y + 7}{12}$$

$$\frac{x-7}{-12} = \frac{-12y}{-12}$$

$$-\frac{1}{12}x + \frac{7}{12} = y$$

$y = -\frac{1}{12}x + \frac{7}{12}$

6. $y = 4x^2$

$$x = \frac{4y^2}{4}$$

$$\sqrt{\frac{1}{4}x} = \sqrt{y^2}$$

$$\sqrt{\frac{1}{4}x} = y$$

$$\frac{1}{2}\sqrt{x} = y$$

$y = \frac{1}{2}\sqrt{x}$

7. $f(x) = x^7$

$$y = x^7$$

$$\sqrt[7]{x} = \sqrt[7]{y^7}$$

$$\sqrt[7]{x} = y$$

$$y = \sqrt[7]{x}$$

$f^{-1}(x) = \sqrt[7]{x}$

8. $f(x) = \frac{5x-3}{2}$

$$y = \frac{5x-3}{2}$$

$$x = \frac{5y-3}{2}$$

$$2x = 5y-3$$

$$+3 \quad +3$$

$$\frac{2x+3}{5} = \frac{5y}{5}$$

$$\frac{2}{5}x + \frac{3}{5} = y$$

$f^{-1}(x) = \frac{2}{5}x + \frac{3}{5}$

9. $y = -\frac{2}{3}x + 5$

$$x = -\frac{2}{3}y + 5$$

$$-\frac{3}{2}(x-5) = (-\frac{2}{3}y)(-\frac{3}{2})$$

$$-\frac{3}{2}x + \frac{15}{2} = y$$

$y = -\frac{3}{2}x + \frac{15}{2}$

10. $y = 8x^2 - 13$

$$x = \frac{8y^2 - 13}{8}$$

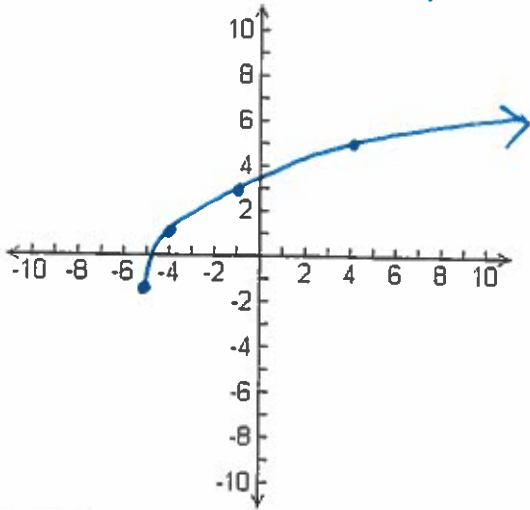
$$\frac{x+13}{8} = \frac{8y^2}{8}$$

$$\sqrt{\frac{1}{8}x + \frac{13}{8}} = \sqrt{y^2}$$

$y = \sqrt{\frac{1}{8}x + \frac{13}{8}}$

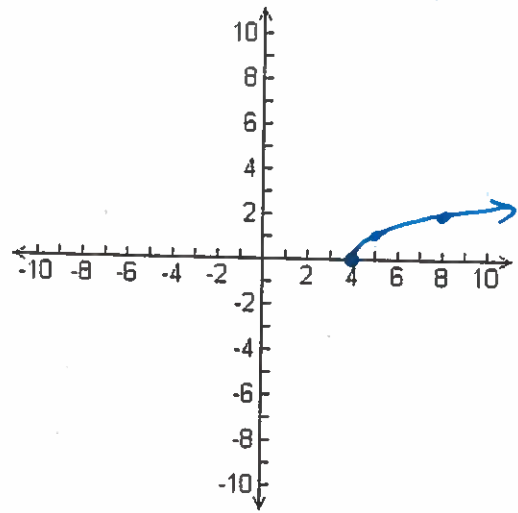
Graph the radical function.

11. $y = 2\sqrt{x+5} - 1$ $(-5, -1)$



1 x 2
4 2 4
9 3 6
16 4 8

12. $y = \sqrt{x-4} + 0$ $(4, 0)$



1 1
4 2
9 3
16 4

15. Graph $f(x) = |x| + 2$
Does the function have an inverse?
Explain why or why not?

↙ No. The graph is a v-shape and does not pass the horizontal line test.

16. Graph $f(x) = x^3$
Does the function have an inverse?
Explain why or why not?

↘ Yes. The graph passes the horizontal line test.

Verify that the functions are inverses.

9. $f(x) = \frac{2x-1}{5}$ $g(x) = \frac{5x+1}{2}$

$$f(g(x)) = \frac{2\left(\frac{5x+1}{2}\right) - 1}{5}$$

$$= \frac{5x+1-1}{5}$$

$$= \frac{5x}{5} = x \checkmark$$

$$g(f(x)) = \frac{5\left(\frac{2x-1}{5}\right) + 1}{2}$$

$$= \frac{2x-1+1}{2}$$

$$= \frac{2x}{2} = x \checkmark$$

10. $f(x) = 4x^2 - 5$ $g(x) = \sqrt{\frac{x+5}{4}}$

$$f(g(x)) = 4\left(\sqrt{\frac{x+5}{4}}\right)^2 - 5$$

$$= 4\left(\frac{x+5}{4}\right) - 5$$

$$= x+5-5 = x \checkmark$$

$$g(f(x)) = \sqrt{\frac{4x^2-5+5}{4}}$$

$$= \sqrt{\frac{4x^2}{4}}$$

$$= \sqrt{x^2} = x \checkmark$$