

"6A: 3"

## WORKSHEET 7.4 INVERSE FUNCTIONS

$\rightarrow f(x) \rightarrow f^{-1}(x)$

1. Graph + state if a function, 2. State D + R

### 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. Get inverse + do the same.

4. Graph on same grid to see reflection over  $y=x$

### Finding Inverses

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

3.  $y = 3x + 2$

4.  $y = -5x - 7$

~~5.~~  $y = 12x - 3$

6.  $y = -8x + 16$

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

8.  $y = -\frac{3}{4}x + 5$

9.  $y = -\frac{5}{8}x + 10$

10.  $y = \frac{1}{2}x + 8$

11.  $y = x^2 + 5$

12.  $y = x^2 - 4$

13.  $y = (x + 3)^2$

14.  $y = (x - 6)^2$

15.  $y = \sqrt{x - 2}, y \geq 0$

16.  $y = \sqrt{x + 5}, y \geq 0$

17.  $y = \sqrt{x} + 8, y \geq 8$

18.  $y = \sqrt{x} - 7, y \geq -7$

### 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.~~  $f(x) = 2x - 7, g(x) = \frac{x + 7}{2}$

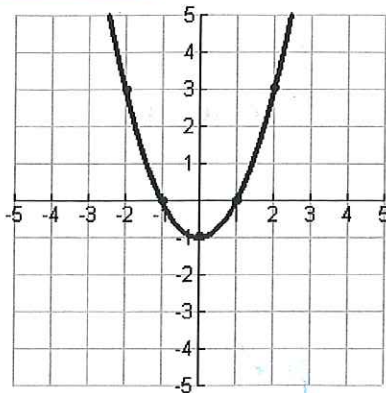
~~23.~~  $f(x) = -4x + 8, g(x) = -\frac{1}{4}x + 2$

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

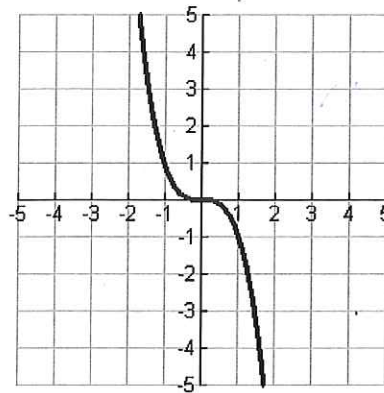
  
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**Graphing Inverses** (Make a dotted line of  $y=x$ )  
Graph the inverse for each relation below (put your answer on the same graph).

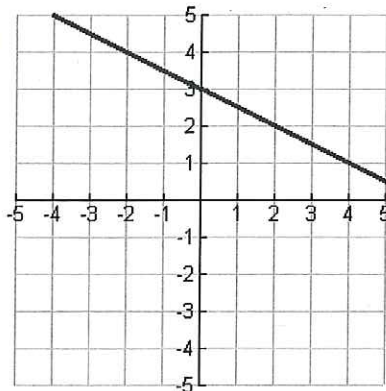
25.



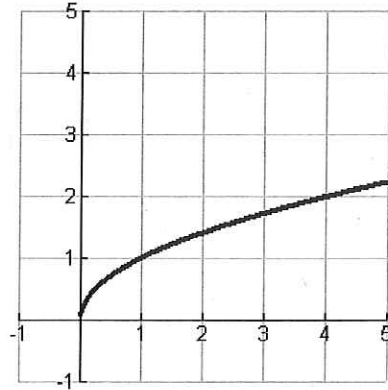
26.



27.



~~28.~~



29-31 :

write the equations for  $f(x)$  and  $f^{-1}(x)$   
 for the graphs above,  
 stating Domain & Range for each.

## ANSWERS – Worksheet 7.4

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

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

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

4.  $y = -\frac{x+7}{5}$

~~5.  $y = \frac{x+3}{12}$~~

6.  $y = \frac{1}{8}x - 2$

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

8.  $y = -\frac{4}{3}x + \frac{20}{3}$

9.  $y = -\frac{8}{5}x - 16$

10.  $y = 2x - 16$

11.  $y = \pm\sqrt{x-5}$

12.  $y = \pm\sqrt{x+4}$

13.  $y = -3 \pm \sqrt{x}$

14.  $y = 6 \pm \sqrt{x}$

15.  $y = x^2 + 2, x \geq 0$

16.  $y = x^2 - 5, x \geq 0$

17.  $y = (x-8)^2, x \geq 8$

18.  $y = (x+7)^2, x \geq -7$

19. verify

20. verify

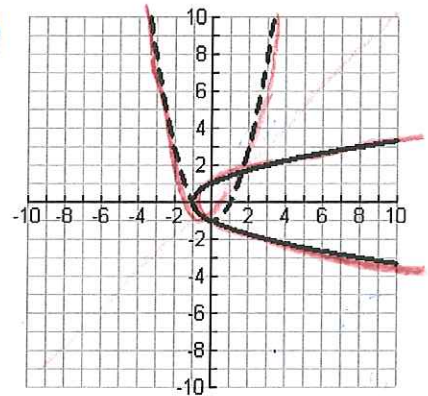
21. verify

22. verify

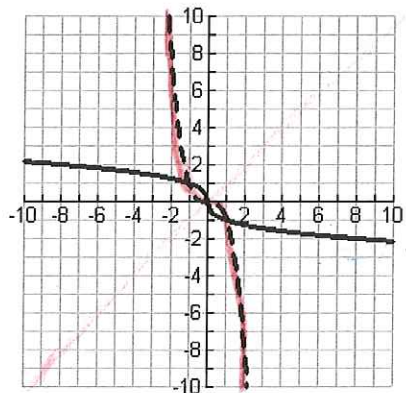
23. verify

24. verify

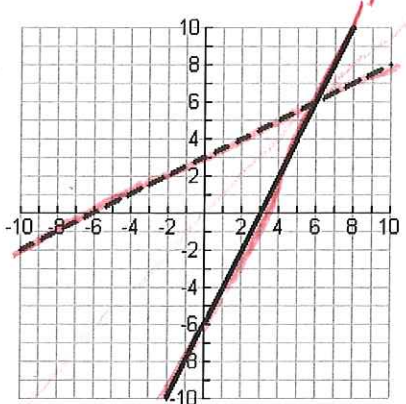
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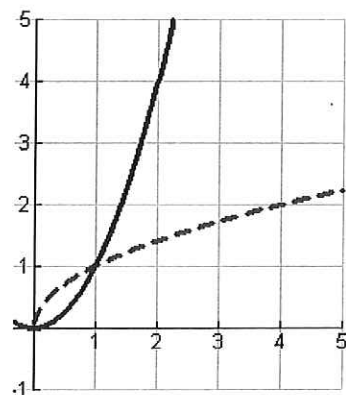
26.



27.



28.



$$(29) \quad f(x) = x^2 - 1 \quad D: x \in \mathbb{R} \quad R: y \geq -1$$

$$\# 25 \quad f^{-1}(x) = \pm \sqrt{x+1} \quad D: x \geq -1 \quad R: y \in \mathbb{R}$$

$$(30) \quad f(x) = -x^3 \quad D \text{ \& } R \rightarrow \text{all reals}$$

$$\# 26 \quad f^{-1}(x) = -\sqrt[3]{x} \quad " \quad "$$



$$(31) \quad f(x) = -\frac{1}{2}x + 3 \quad " \quad "$$

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