For each set of ordered pairs, determine if the set is a function, a one-to-one function, or neither.

1. (5,4),(4,3),(3,3),(2,4)

Function

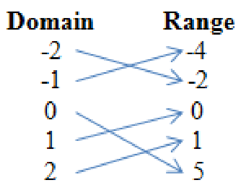
NOT one-to-one

2. (0,5),(-4,5),(-4,2),(0,2)

Neither

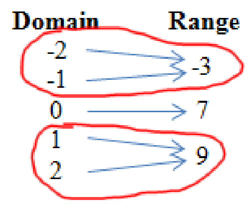
Determine if the function is one-to-one.

3.



Yes!

4.



NO :(

5. No, not one-to-one

6. Yes, one-to-one

Determine if g is the inverse of f.

7. $f(x) = 3x + 5$ and $g(x) = \frac{1}{3}x - \frac{5}{3}$

$f(g(x)) = x$ and $g(f(x)) = x$

$3\left(\frac{1}{3}x - \frac{5}{3}\right) + 5$

$x - 5 + 5$

x

Yes!

$\frac{1}{3}(3x+5) - \frac{5}{3}$

$x + \frac{5}{3} - \frac{5}{3}$

x

8. $f(x) = \sqrt[3]{3 - x}$ and $g(x) = x^3 - 3$

$f(g(x)) = x$ and $g(f(x)) = x$

$\sqrt[3]{3 - (x^3 - 3)}$

$\sqrt[3]{3 - x^3 + 3}$

$\boxed{\sqrt[3]{6 - x^3}}$

No!

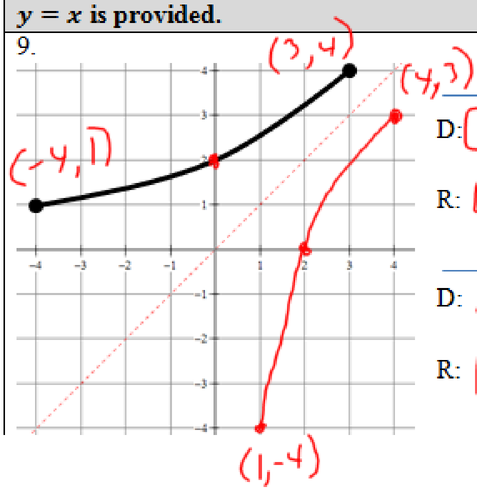
$\left(\sqrt[3]{3-x}\right)^3 - 3$

$3 - x - 3$

$\boxed{-x}$

Find the domain and range of f, sketch the graph of f^{-1}, and find the domain and range of f^{-1}. The graph of $y = x$ is provided.

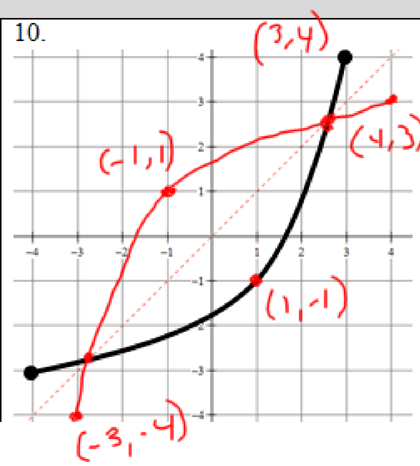
9.



	f
D:	$[-4,3]$
R:	$[1,4]$

	f^{-1}
D:	$[1,4]$
R:	$[-4,3]$

10.



	f
D:	$[-4,3]$
R:	$[-3,4]$

	f^{-1}
D:	$[-3,4]$
R:	$[-4,3]$

Graph f and verify that f is one-to-one function. Find f^{-1} and add the graph of f^{-1} and the line $y = x$ to the graph f. State the domain and range of f and the domain and range of f^{-1}.

11. $f(x) = -\sqrt{x+1} + 3$

$x = -\sqrt{y+1} + 3$

$-3 \qquad -3$

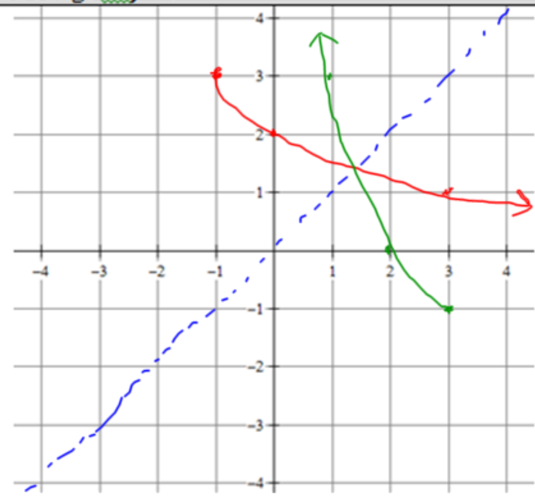
$(x-3)^2 = \left(-\sqrt{y+1}\right)^2$

$(x-3)^2 = y + 1$

$-1 \qquad -1$

$(x-3)^2 - 1 = y$

$\boxed{f^{-1}(x) = (x-3)^2 - 1}$



f	f^{-1}
D: $[-1, \infty)$	**D:** $(-\infty, 3]$
R: $(-\infty, 3]$	**R:** $[-1, \infty)$

The function is one-to-one. Find f^{-1}.

12. $f(x) = \frac{2}{x-1}$

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

$(y-1)x = \frac{2}{\cancel{y-1}}\cancel{(y-1)}$

$xy - x = 2$

$+x \qquad +x$

$\frac{xy}{x} = \frac{2+x}{x}$

$\boxed{y = \frac{2+x}{x}}$

13. $f(x) = \frac{2x+5}{3x-4}$

$x = \frac{2y+5}{3y-4}$

$(3y-4)\,x = \frac{2y+5}{\cancel{3y-4}}\cancel{(3y-4)}$

$3xy - 4x = 2y + 5$

$+4x \qquad +4x$

$3xy = 2y + 5 + 4x$

$-2y \qquad -2y$

$3xy - 2y = 5 + 4x$

$\frac{y\cancel{(3x-2)}}{\cancel{3x-2}} = \frac{5+4x}{3x-2}$

$y = \frac{4x+5}{3x-2}$

REVIEW SKILLS

Use the quadratic formula to solve. Express your solution(s) in exact and decimal form.

1. $2b^2 - 19 = -b$

$+b \qquad +b$

$2b^2 + b - 19 = 0$

$\frac{-1 \pm \sqrt{(1)^2 - 4(2)(-19)}}{2(2)}$

$\frac{-1 \pm \sqrt{153}}{4}$

$\frac{-1 \pm \sqrt{9}\sqrt{17}}{4}$

$\boxed{b = \frac{-1 + 3\sqrt{17}}{4} \text{ or } \frac{-1 - 3\sqrt{17}}{4} \qquad b \approx 2.84 \text{ or } -3.34}$

2. $r^2 = 2r - 8$

$-2r \qquad -2r$

$r^2 - 2r = -8$

$+8 \qquad +8$

$r^2 - 2r + 8 = 0$

$\frac{2 \pm \sqrt{(-2)^2 - 4(1)(8)}}{2(1)}$

$\frac{2 \pm \sqrt{-28}}{2}$

$\frac{2 \pm 2i\sqrt{7}}{2} = \frac{\cancel{2}(1 \pm i\sqrt{7})}{\cancel{2}}$

$\boxed{r = 1 + i\sqrt{7} \text{ or } 1 - i\sqrt{7} \qquad r \approx 1 + 2.65i \text{ or } 1 - 2.65i}$