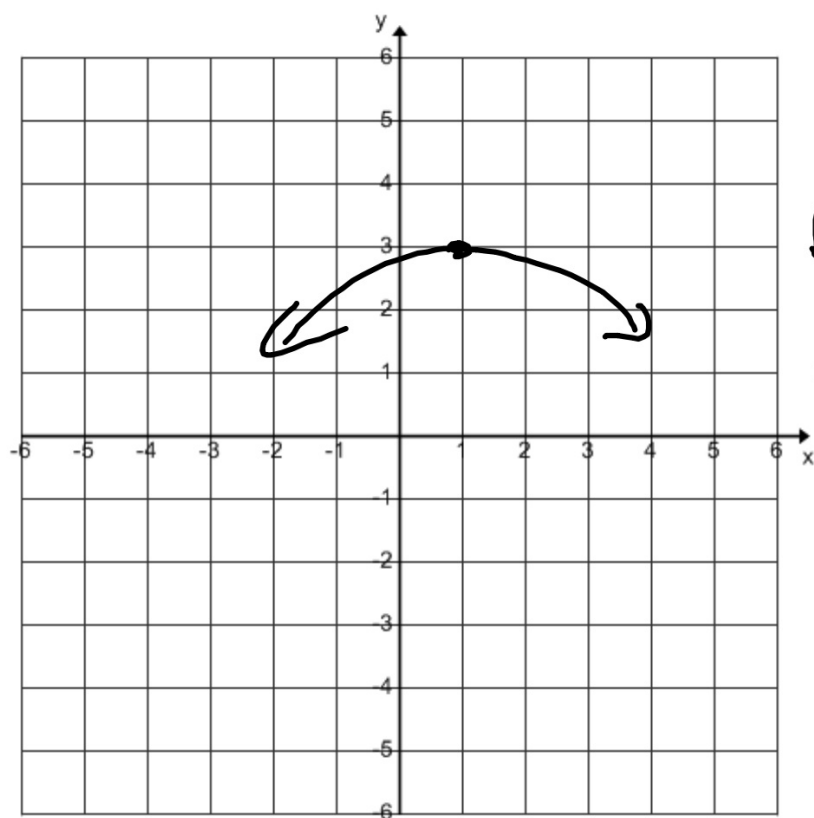


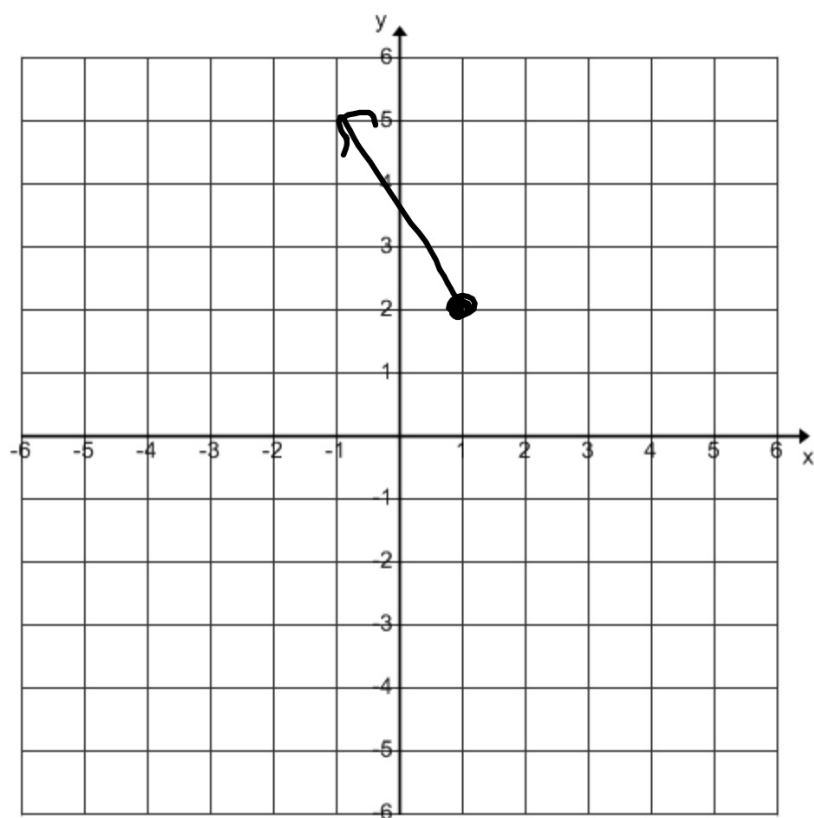
$$D: 1 < x \leq 3$$

$$R: -2 < y \leq 2$$



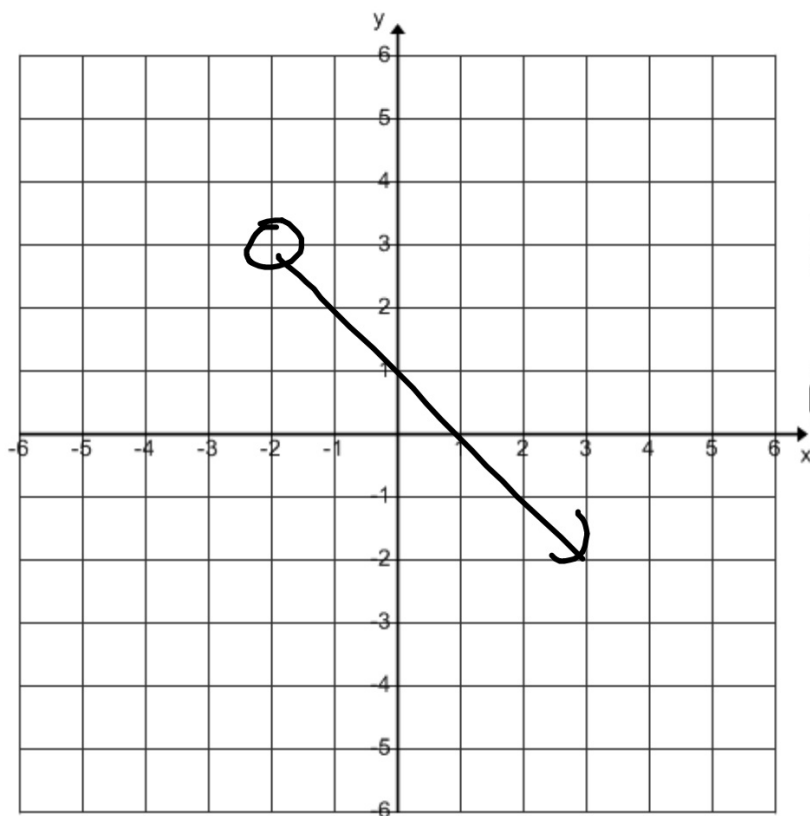
D:  $\mathbb{R}$

R:  $y \leq 3$



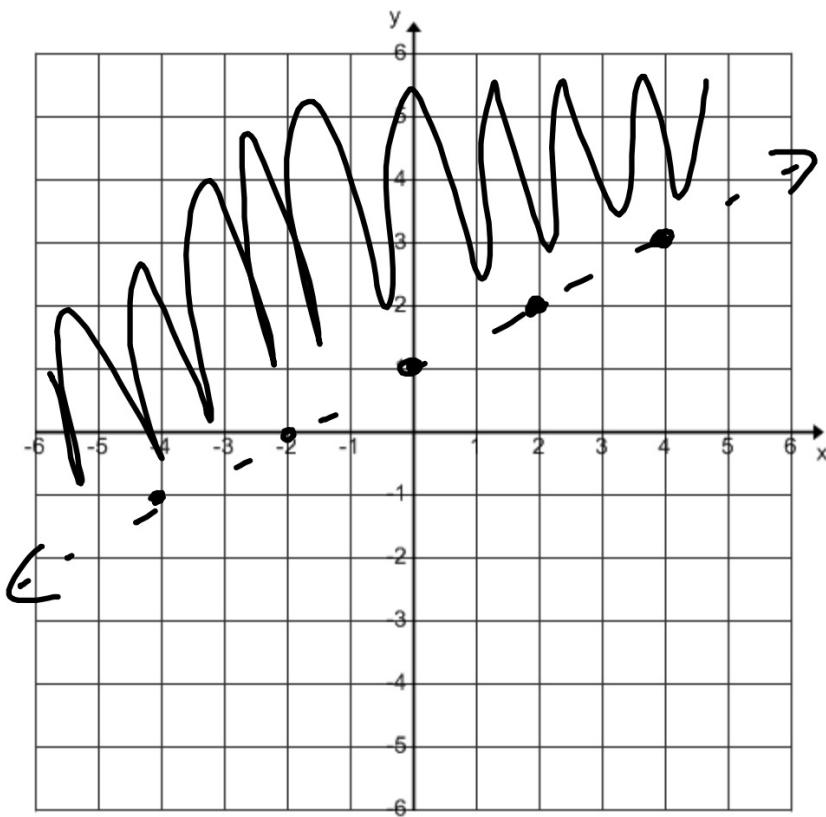
$$D: x \leq 1$$

$$R: y \geq 2$$

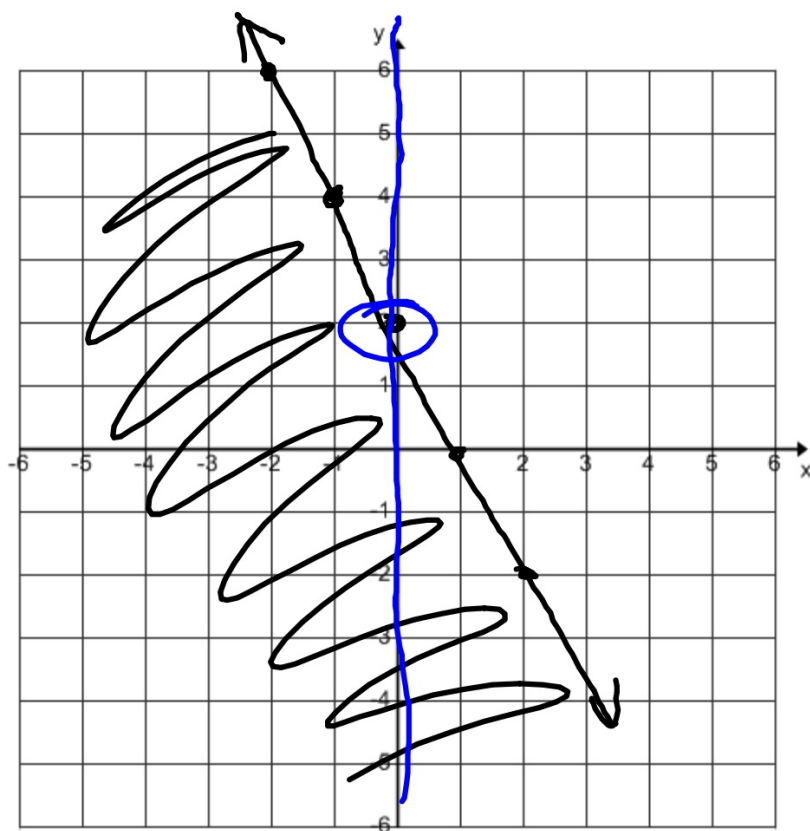


D:  $x > -2$

R:  $y < 3$

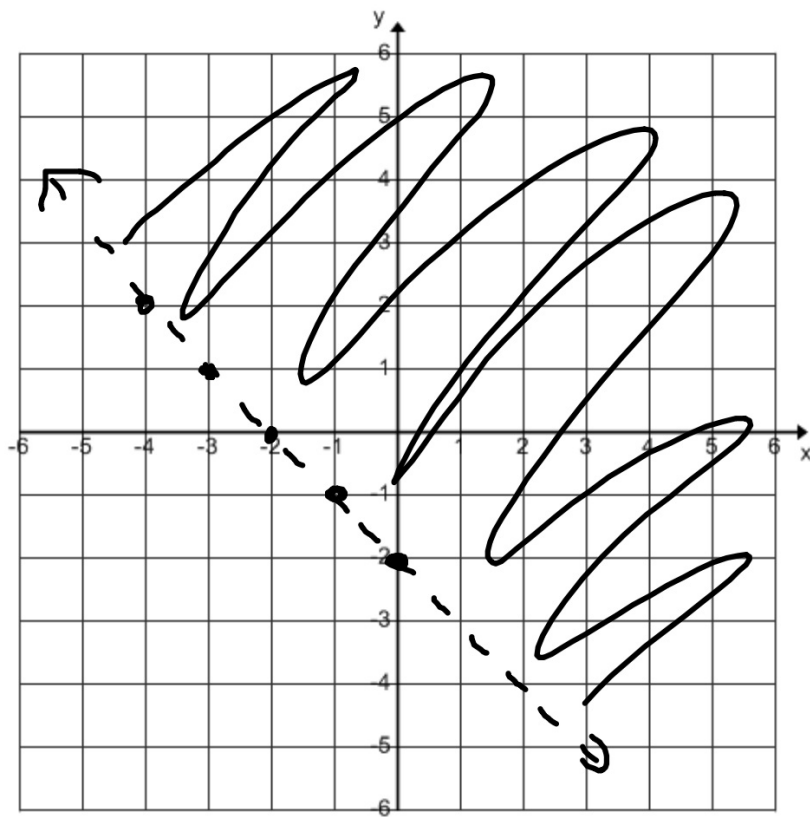


$$y > \frac{1}{2}x + 1$$



$$y \leq -2x + 2$$

3



2

$$y > -x - 2$$

### Domain

$$(15) f(x) = \frac{6}{x-1} \neq 0$$

$$\begin{array}{r} x-1 \neq 0 \\ +1 \quad +1 \\ \hline \end{array}$$

$\mathbb{R}$  except  $x \neq 1$

$$(17) f(x) = \sqrt{x-4} \geq 0$$

$$\begin{array}{r} x-4 \geq 0 \\ +4 \quad +4 \\ \hline \end{array}$$

$\mathbb{R}: x \geq 4$

### Practice

① Find inverse of  $f$

$$f(x) = 3x - 5$$

①  $y = 3x - 5$

②  $x = 3y - 5$

③  $\begin{array}{r} x = 3y - 5 \\ +5 \quad +5 \\ \hline \end{array}$

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

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

②  $f(x) = \frac{x}{2} - 10$

$$y = \frac{x}{2} - 10$$

$$\begin{array}{r} x = \frac{y}{2} - 10 \\ +10 \quad +10 \\ \hline \end{array}$$

$$2(x+10) = \frac{y}{2} \cdot 2$$

$$2x + 20 = f^{-1}(x)$$



$$\textcircled{3} f(x) = 3x - 10$$

$$f(2x-1) = 3 \cdot \boxed{(2x-1)} - 10$$

$$6x - 3 - 10$$

$$6x - 13$$

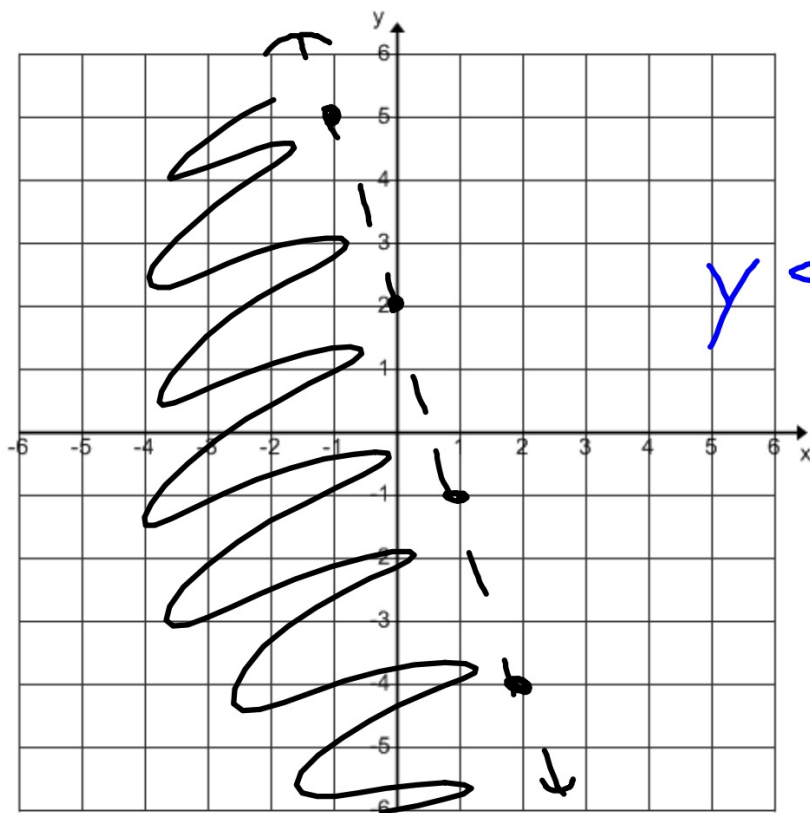
$$\textcircled{4} f(x) = x^2 - 2x$$

$$f(-4) = (-4)^2 - 2(-4)$$

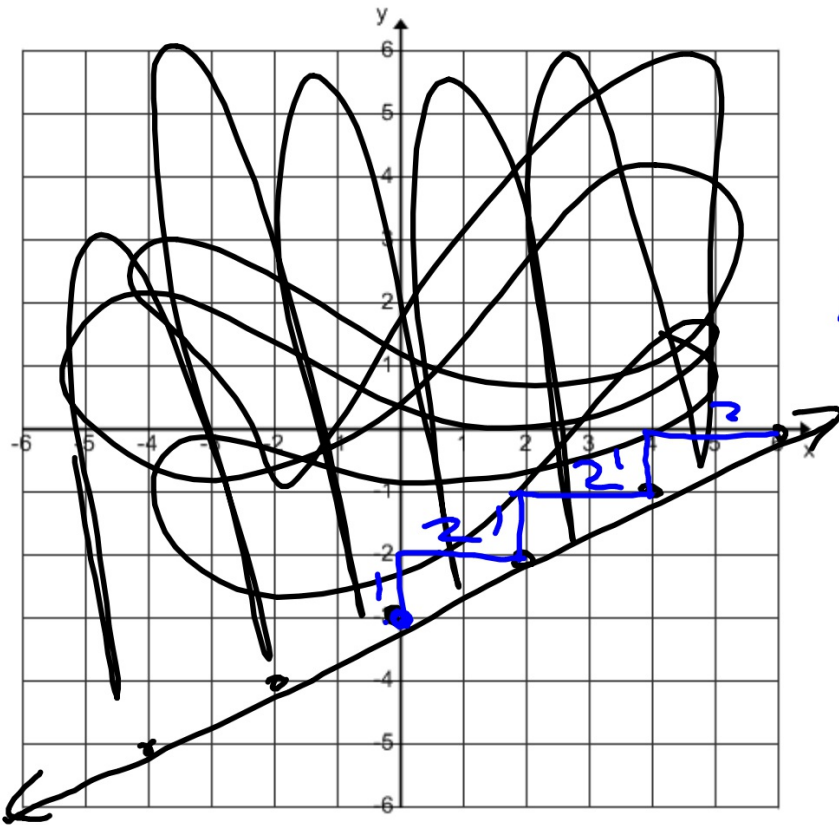
$$16 + 8$$

$$24$$

10-10-17 3<sup>rd</sup> Trig

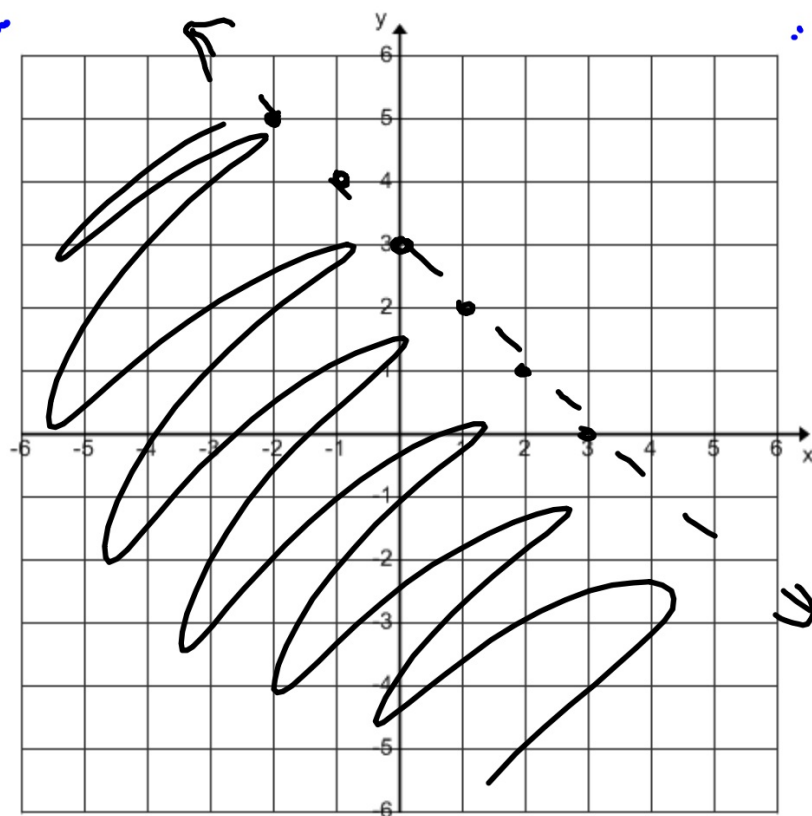


$$y < -3x + 2$$



slope

$$y = \left(\frac{1}{2}\right)x - 3$$



$$y < -x + 3$$

$$\begin{aligned} \textcircled{1} f(x) &= 2x^2 \\ f(-3) &= 2 \cdot (-3)^2 \\ &= 18 \end{aligned}$$

$$\begin{aligned} \textcircled{2} f(x) &= 5x - 2 \\ f(3x+10) &= 5 \cdot (3x+10) - 2 \\ &= 15x + 50 - 2 \\ &= 15x + 48 \end{aligned}$$

Domain

$$\begin{aligned} \textcircled{3} f(x) &= 3x - 3 \\ &\mathbb{R} \end{aligned}$$

$$\begin{aligned} \textcircled{4} f(x) &= \frac{8x^{1000}}{x-18} \\ x-18 &\neq 0 \\ \begin{array}{r} x-18 \neq 0 \\ +18 \quad +18 \\ \hline x \neq 18 \end{array} \end{aligned}$$

$\mathbb{R}$  except  $x \neq 18$

$$\begin{aligned} \textcircled{5} f(x) &= \sqrt{2x-10} \\ 2x-10 &\geq 0 \\ \begin{array}{r} 2x-10 \geq 0 \\ +10 \quad +10 \\ \hline 2x \geq 10 \\ \frac{2x}{2} \geq \frac{10}{2} \\ \mathbb{R}: x \geq 5 \end{array} \end{aligned}$$

⑥ Find inverse of  $f(x) = 3x - 10$

①  $y = 3x - 10$

②  $x = 3y - 10$   
+10                      +10

$$\frac{x+10}{3} = \frac{3y}{3}$$

$$f^{-1}(x) = \frac{x+10}{3}$$

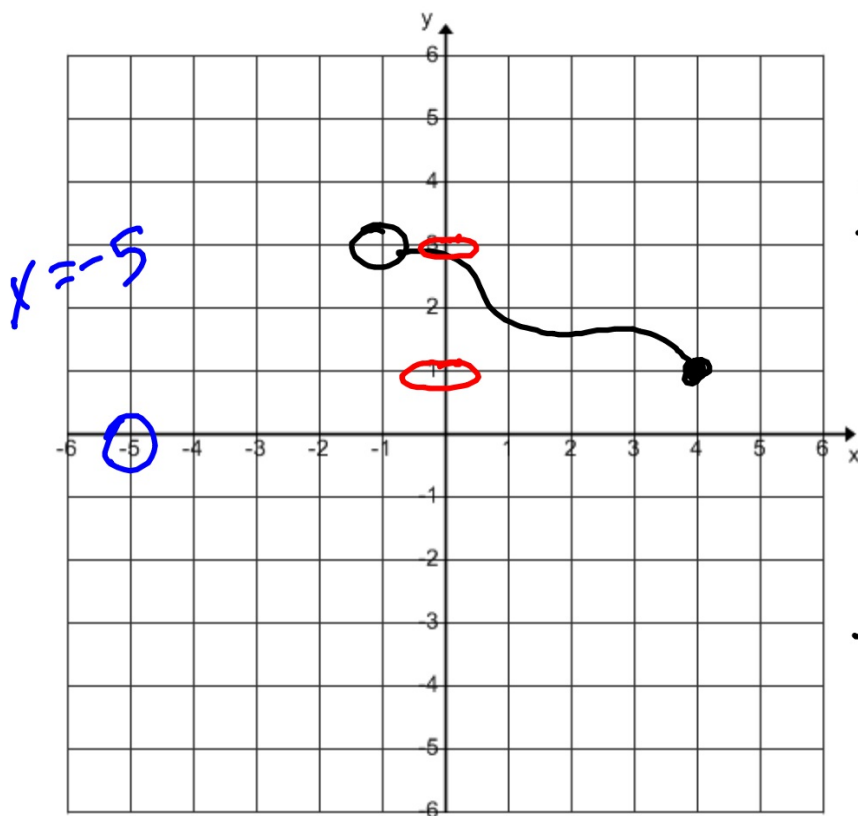
⑦ Find  $f^{-1}(x)$  of  $f(x) = \frac{x}{2} + 7$

①  $y = \frac{x}{2} + 7$

②  $x = \frac{y}{2} + 7$   
-7                      -7

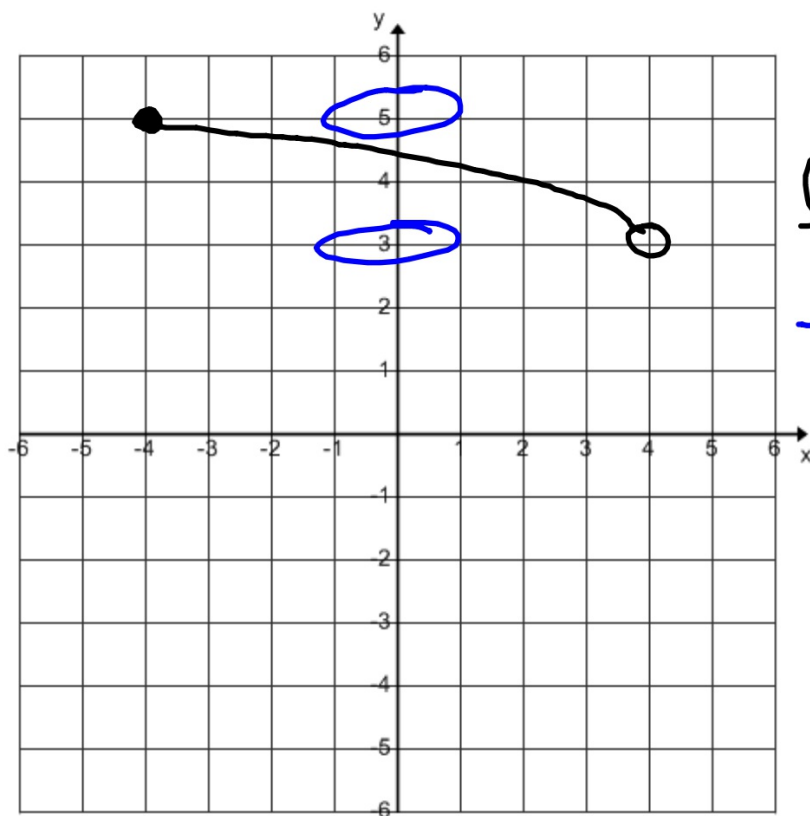
$$2(x-7) = \frac{y}{2} \cdot 2$$

$$2x - 14 = f^{-1}(x)$$



Domain  
 $-1 < x \leq 4$

Range  
 $1 \leq y < 3$



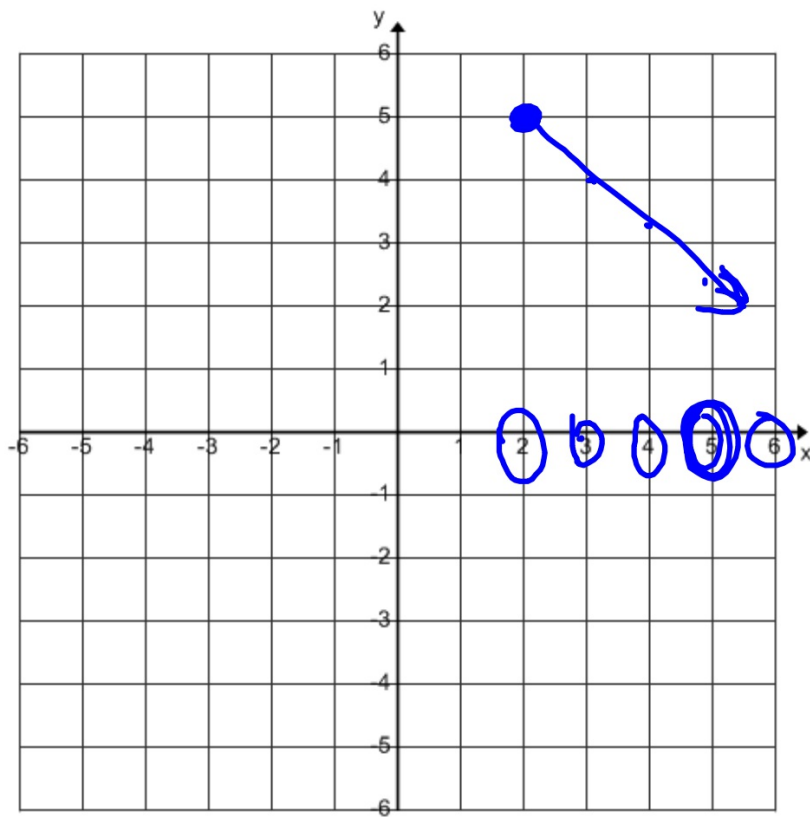
Domain

$$-4 \leq x < 4$$

Range

$$3 < y \leq 5$$



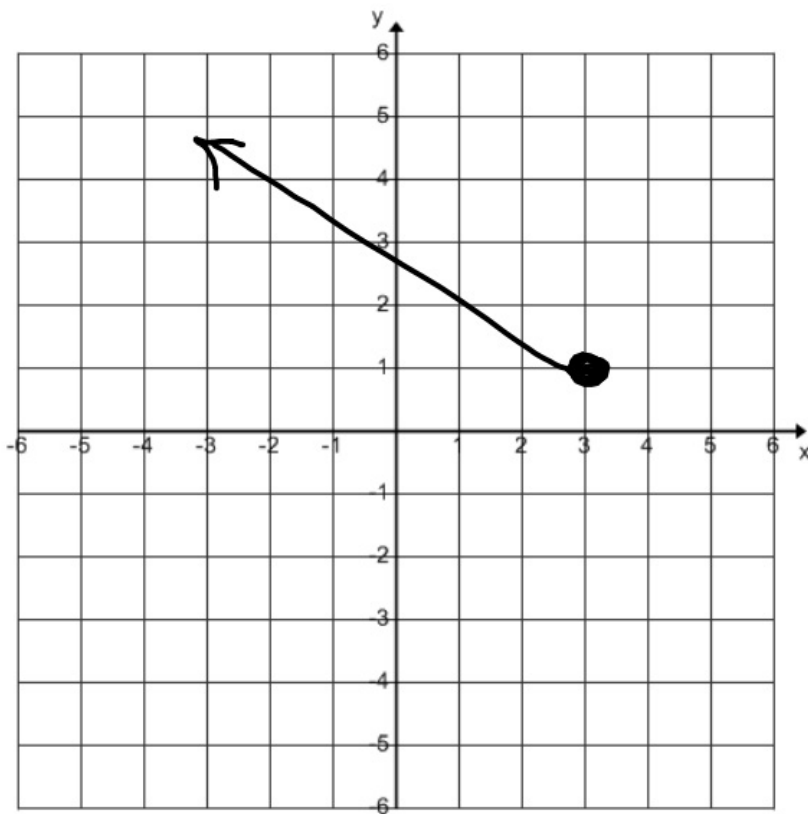


Domain

$$x \geq 2$$

Range

$$y \leq 5$$



$$\frac{\text{Domain}}{x \leq 3}$$

$$\frac{\text{Range}}{y \geq 1}$$

$$f(x) = 3x - 1 \quad g(x) = 2x + 5$$

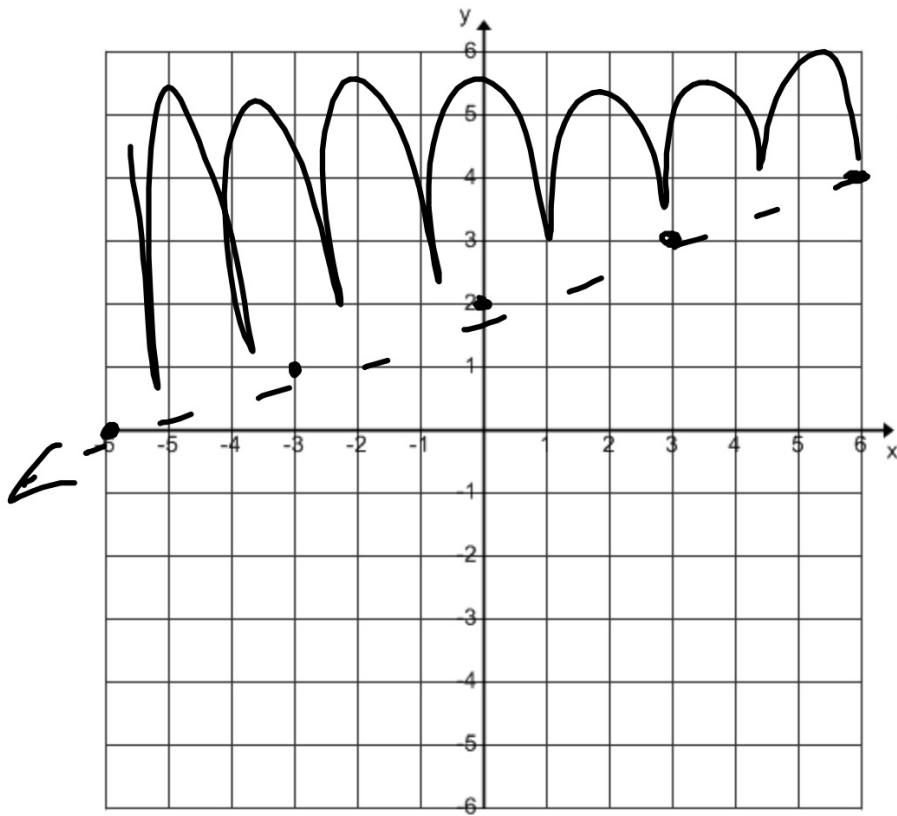
$$f(g(x))$$

$$f(2x+5) = 3 \cdot (2x+5) - 1$$

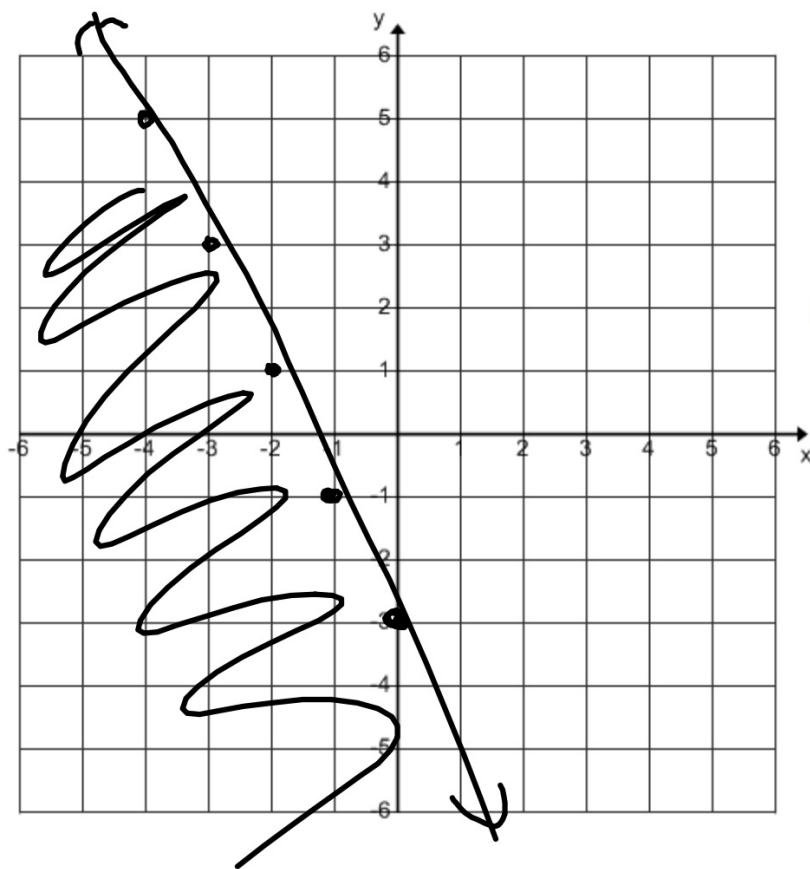
$$6x + 15 - 1$$

$$6x + 14$$

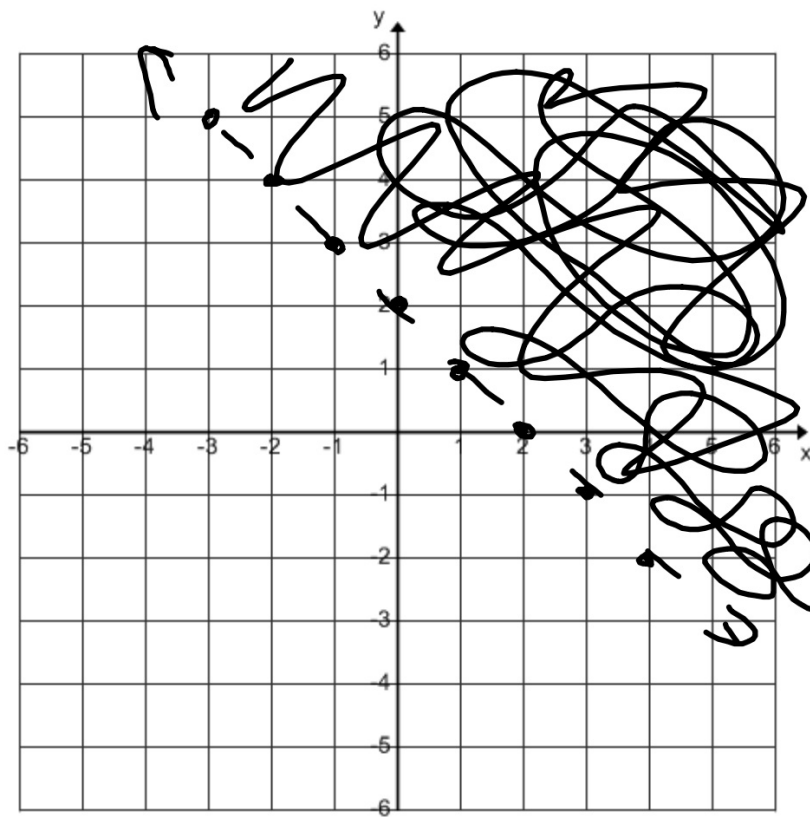
10-10-17 4<sup>th</sup> Trig



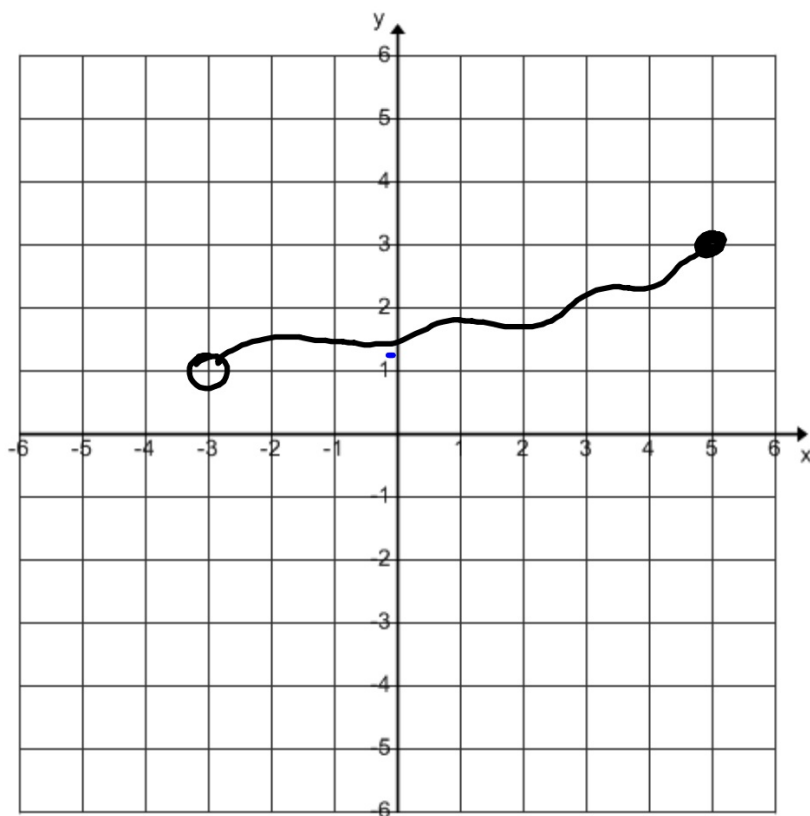
$$y = \frac{1}{3}x + 2$$



$$y \leq -2x - 3$$



$$y = -x + 2$$

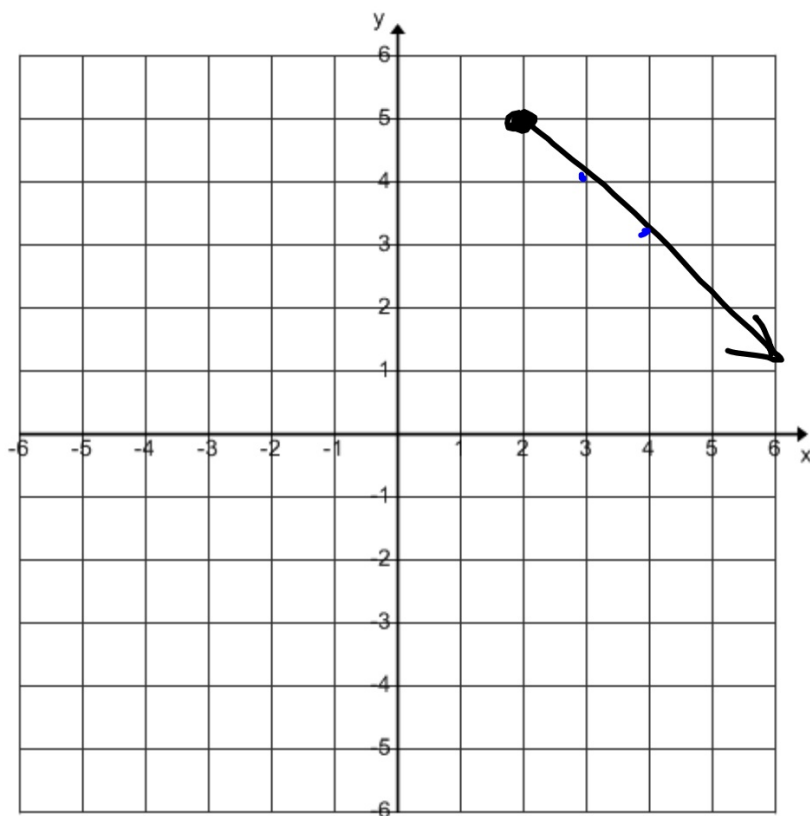


Domain

$$-3 < x \leq 5$$

Range

$$1 < y \leq 3$$

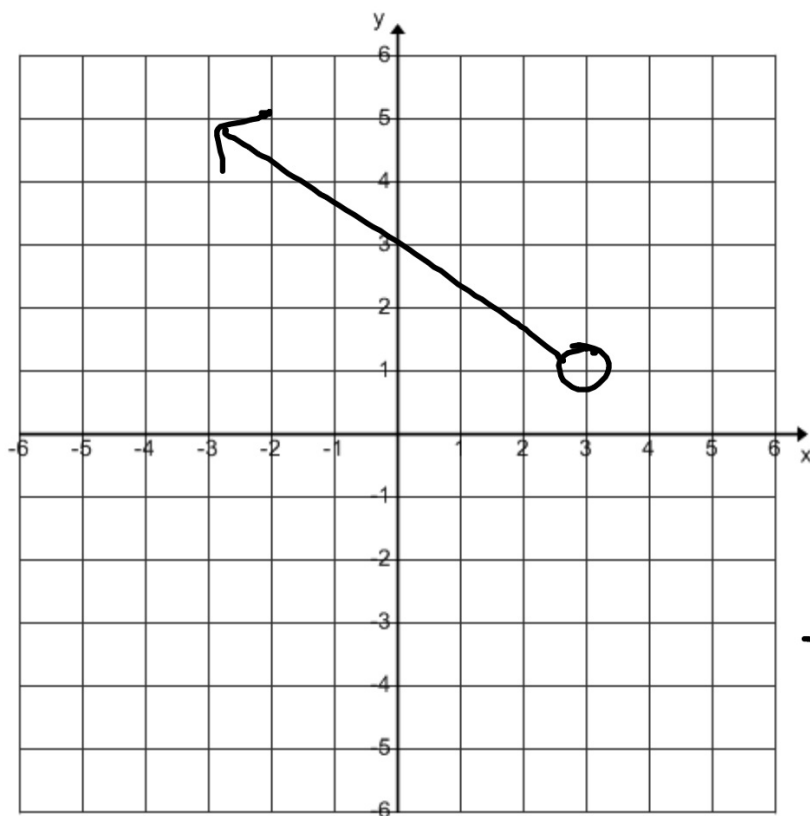


Domain

$$x \geq 2$$

Range

$$y \leq 5$$



Domain

$$x < 3$$

Range

$$y > 1$$



## Domain

$$\textcircled{1} f(x) = 3x - 9$$

$\mathbb{R}$

$$\textcircled{2} f(x) = \frac{x^8 - 1}{x + 7} \neq 0$$

$$\begin{array}{r} x + 7 \neq 0 \\ -7 \quad -7 \\ \hline \end{array}$$

$\mathbb{R}$  except  $x \neq -7$

$$\textcircled{3} f(x) = \sqrt{x - 4} \geq 0$$

$$\begin{array}{r} x - 4 \geq 0 \\ +4 \quad +4 \\ \hline \mathbb{R}: x \geq 4 \end{array}$$

$$\textcircled{4} f(x) = -2x^2$$

$$\begin{array}{r} f(-3) = -2(-3)^2 \\ -2 \cdot 9 \\ -18 \end{array}$$

$$\textcircled{5} \quad f(x) = 3x - 2$$

$$f(5x + 7)$$

$$= 3 \cdot \boxed{(5x + 7)} - 2$$

$$15x + 21 - 2$$

$$15x + 19$$

$$\textcircled{6} \quad f(x) = 2x + 7 \quad g(x) = x - 4$$

$$f(\textcircled{g(x)})$$

$$f(x - 4) = 2 \cdot \boxed{(x - 4)} + 7$$

$$2x - 8 + 7$$

$$2x - 1$$

⑦ Give the inverse of

$$f(x) = 3x - 10$$

①  $y = 3x - 10$

②  $x = 3y - 10$

③  $\frac{-10}{+10}$

$$\frac{x+10}{3} = \frac{y}{3}$$

$$f^{-1}(x) = \frac{x+10}{3}$$

⑧ Give  $f^{-1}(x)$  of  $f(x) = \frac{x}{2} - 7$

①  $y = \frac{x}{2} - 7$

②  $x = \frac{y}{2} - 7$

$\frac{+7}{+7}$

$$2(x+7) = \frac{y}{2} \cdot 2$$

$$2x + 14 = y$$

$$f^{-1}(x) = 2x + 14$$

