Algebra 1B 4.7

Find the inverse of a relation

Find the inverse of a linear function

relation (x, y)

inverse special kind of relation

function

inverse function $x \leftrightarrow y$

domain x

range y

whiteboards

Example 1 **Find the inverse of each relation.**

1. $\{(4, -15), (-8, -18), (-2, -16.5), (3, -15.25)\}$

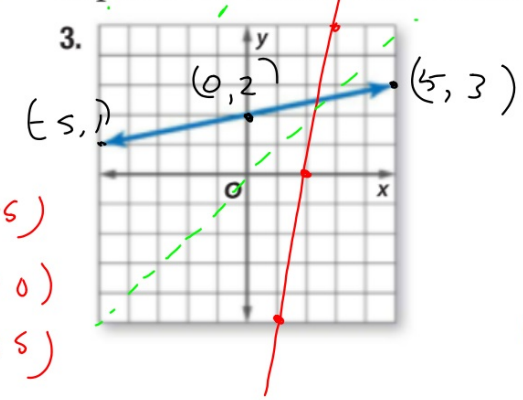
2.

x	−3	0	1	6
y	11.8	3.7	1	−12.5

(11.8, -3) (3.7, 0) (1, 1) (-12.5, 6)

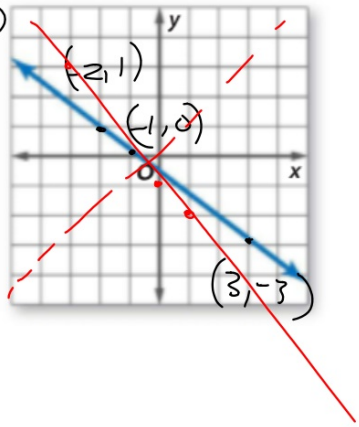
Example 2 Graph the inverse of each relation.

3.



(1, −5)
(2, 0)
(3, 5)

4.



(1, −2)
(0, −1)
(−3, 3)

$x \longleftrightarrow y$

Example 3 **Find the inverse of each function.**

5. $f(x) = -2x + 7$

$x = -2y + 7$

$+2y \quad +2y$

$2y + x = 7$

$-x \quad -x$

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

6. $f(x) = \frac{2}{3}x + 6$

$x = \frac{2}{3}y + 6$

$-\frac{2}{3}y \quad -\frac{2}{3}y$

$-\frac{2}{3}y + x = 6$

$-x \quad -x$

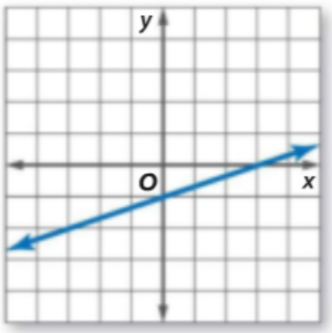
$\left(-\frac{3}{2}\right)\left(-\frac{2}{3}\right)y = -x\left(-\frac{3}{2}\right) + 6\left(-\frac{3}{2}\right)$

$y = -\frac{3}{2} \cdot -x + 6 \cdot -\frac{3}{2}$

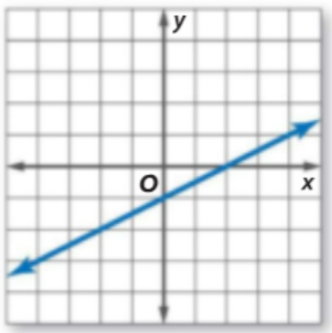
$f^{-1}(x) = \frac{3}{2}x - 9$

Example 2 Graph the inverse of each relation.

12.



13.



Write the inverse of each equation in $f^{-1}(x)$ notation.

22. $3y - 12x = -72$

23. $x + 5y = 15$

24. $-42 + 6y = x$

25. $3y + 24 = 2x$

$3y - 12x = -72$

$3x - 12y = -72$

26. $-7y + 2x = -28$

27. $3y - x = 3$