

Describe how the graph $y = \sqrt{x}$ has been transformed.

A1. $y = \sqrt{x-1} + 3$

→ 1 ↑ 3

reflected a/o x-axis

G1. $y = 2\sqrt{x}$

expanded vertically 2x

J1. $y = 3\sqrt{x-1}$
- expanded vertically 3x
- reflected a/o y-axis
- down 1

Describe how the graph $y = |x|$ has been transformed.

A2. $y = |x+7| - 4$

← 7 ↓ 4

D2. $y = |-x|$
reflect a/o y-axis

G2. $y = \frac{1}{2}|3x|$

- vert. comp. by $\frac{1}{2}$
- hor. comp. by $\frac{1}{3}$

J2. $y = -3|2x-2| = -3|2(x-1)|$

- reflect a/o x-axis
- vert. exp by 3
- horz. comp by 2
- translate → 1

The point (6, -3) is on the graph $y = f(x)$. Determine the coordinates of the corresponding point.

B1. $y = f(x-3) + 2$

$(x+3, y+2)$
 $(6+3, -3+2)$
 $(9, -1)$

E1. $y = f(-x)$

$(-x, y)$
 $(-6, -3)$

H1. $y = \frac{1}{3}f(2x)$

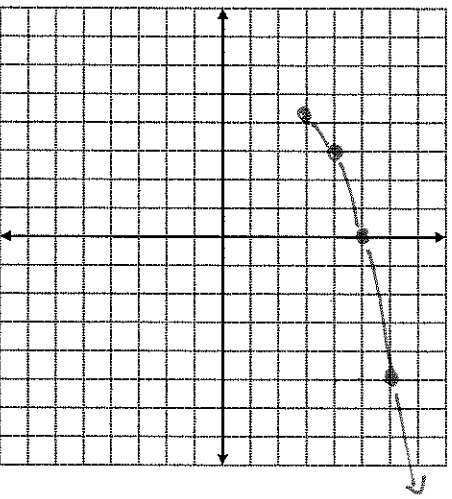
$(\frac{1}{2}x, \frac{1}{3}y)$
 $(\frac{1}{2} \cdot 6, \frac{1}{3} \cdot -3)$
 $(3, -1)$

K1. $y = -3f(-x-4) + 2$

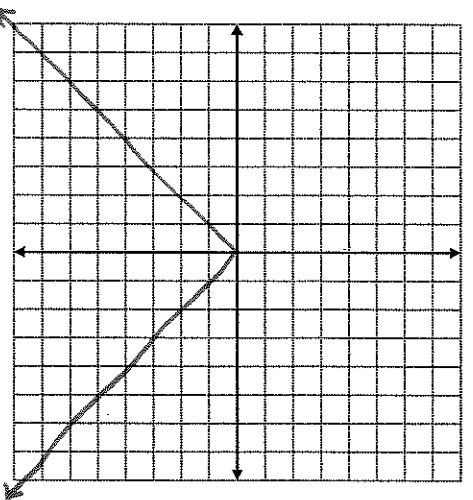
$= -3f(-(x+4)) + 2$
 $(-x-4, -3y+2)$
 $(-6-4, -3(-3)+2)$
 $(-10, 11)$

Sketch the graph of each function.

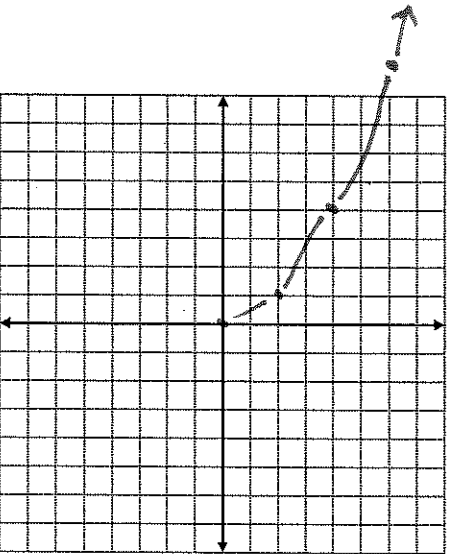
B2. $y = \sqrt{x+4} + 3$



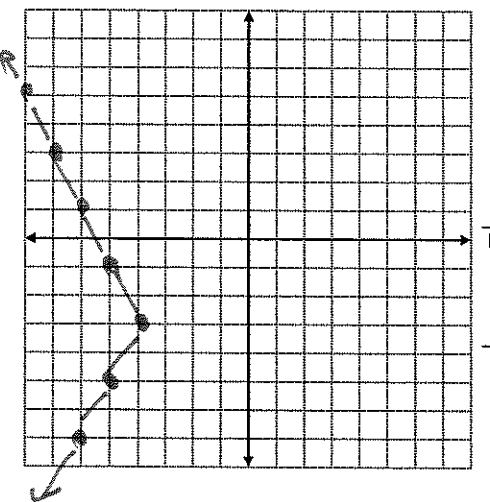
E2. $y = -|x|$



H2. $y = 2\sqrt{-x}$



K2. $y = -\frac{1}{2}(x-3) - 4$



Write the equation of the image of $y = x^2$ after the following transformations.

C1. Translated 8 units right and 6 units up.

$y = (x-8)^2 + 6$

F1. A vertical reflection in the x-axis.

$y = -x^2$

I1. A vertical expansion by 2 and a horizontal compression by $\frac{1}{4}$.

$y = 2(4x)^2$

L1. A vertical expansion by 3, a vertical reflection in the x-axis, and a translation 4 units left and 5 units down.

$y = -3(x+4)^2 - 5$

Write the equation of the image of $y = f(x)$ after the following transformations.

C2. A translation 5 units left and 4 units down.

$$y = f(x+5) - 4$$

$$y = f(-x)$$

F2. A horizontal reflection in the y-axis.

I2. A vertical compression by $1/3$ and a horizontal expansion by 5. $y = \frac{1}{3} f\left(\frac{1}{5}x\right)$

L2. A horizontal compression by $1/3$, a vertical compression by $1/2$, a horizontal reflection in the y-axis and a translation 6 units right and 2 units up.

$$y = \frac{1}{2} f(-3(x+6)) + 2$$

Determine the equation of the inverse, restricting the domain of the original function if necessary.

M1/O1. $y = (x-1)^2 + 3$

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

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

Restriction \downarrow

$$x \geq 1$$

or

$$x \leq 1$$

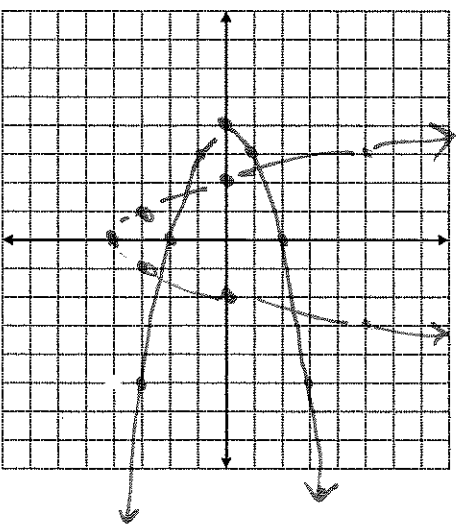
M2. $y = 3x + 6$

$$x = 3y + 6$$

NO

RESTRICTIONS

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



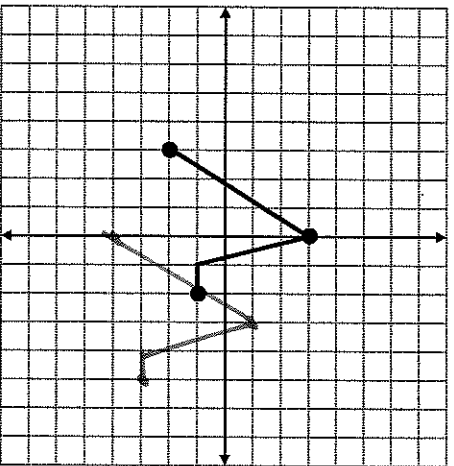
N1/O2. Sketch the graph of $y = x^2 - 4$ and

its inverse on the same grid. Restrict the domain

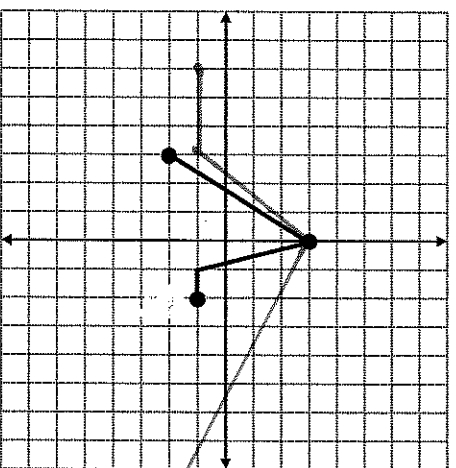
of the original function so that the inverse is a function.

Restriction \downarrow

$$x \geq 0 \text{ or } x \leq 0$$



B3. $y = f(x-3) - 2$



H3. $y = f\left(-\frac{1}{3}x\right)$

K3. $y = -2f(x+1) + 3$

N2. $y = f^{-1}(x)$

