

NO CALCULATORS

1. If the graph of $y = f(x)$ is translated q units right, what equation will represent this transformation?

2. If $y = f(x)$ is translated 5 units up, horizontally expanded by a factor of 3 and reflected in the y-axis, what equation will represent these transformations?

3. For each of the following, write an equation that represents the indicated transformation.
 - a) $y = x^3$ reflected in the x-axis and translated 4 units left

 - b) $x^2 + y^2 = 1$ vertically expanded by a factor of 5

 - c) $y = 4^x$ translated 6 units down and 3 units right

4. If (x, y) is a point on the graph of $y = f(x)$, what is the corresponding point on the graph of:
 - a) $4y = f(x-2)$

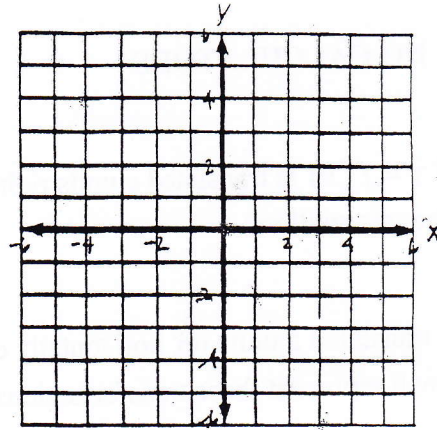
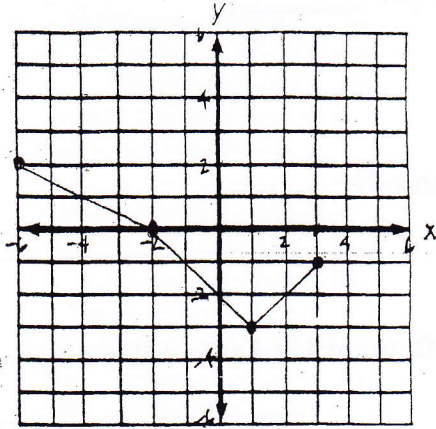
 - b) $y = -f(2x)$

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

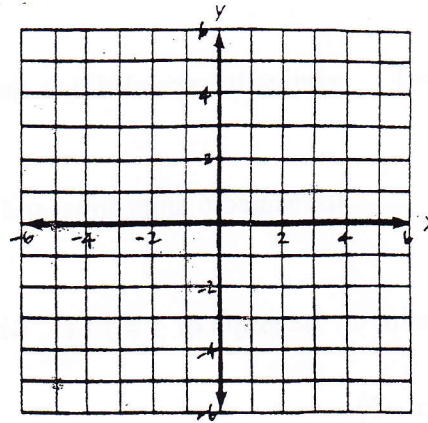
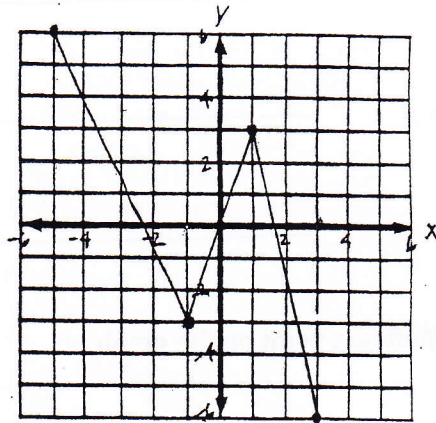
 - d) $y = -2f(4x-4)$

5. Determine $f^{-1}(x)$, the inverse of $f(x) = \sqrt[3]{x} + 4$

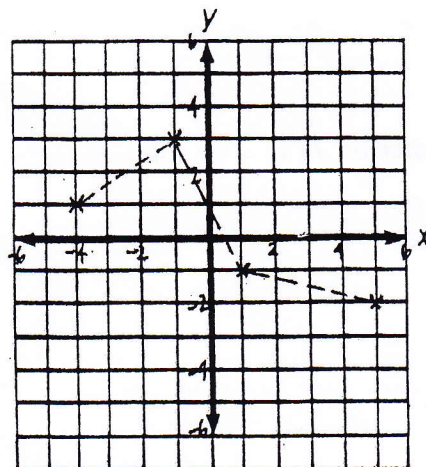
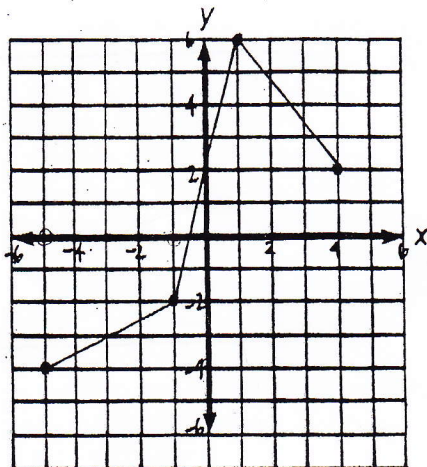
6. Given $y = f(x)$, sketch the graph of $y = 2f(x-2)$ on the grid to the right.



7. Given $y = f(x)$, sketch the graph of $y = -\frac{1}{3}f(x) + 2$ on the grid to the right.



8. Given $y = f(x)$, write an equation for the transformed function in the broken line graph.



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No Calculators

Describe how the graphs of the following functions can be obtained from the graphs of $y = f(x)$.

1. $y = f(x-5)$

2. $5y = -f(x)$

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

For each of the following relations, write an equation that represents the indicated transformations.

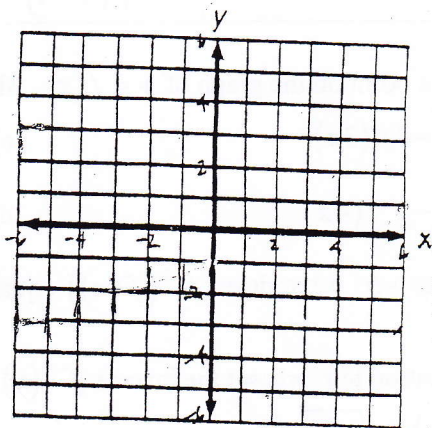
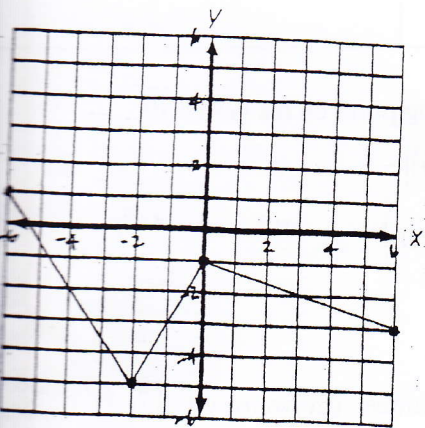
$y = f(x)$ vertical translation down 3 units, horizontal compression by a factor of $\frac{1}{5}$

$x^2 + y^2 = 1$ horizontal translation right 2 units, vertical expansion by a factor of 3.

$f(x) = \sqrt{x-4} + 3$ reflection in the y-axis, vertical translation up 4 units

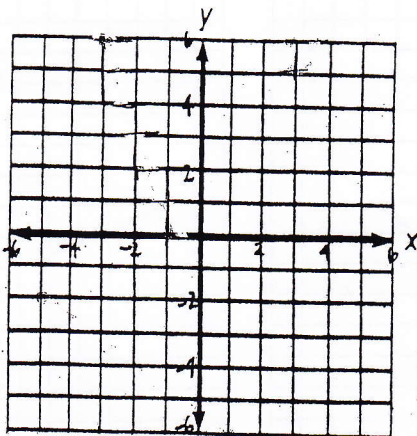
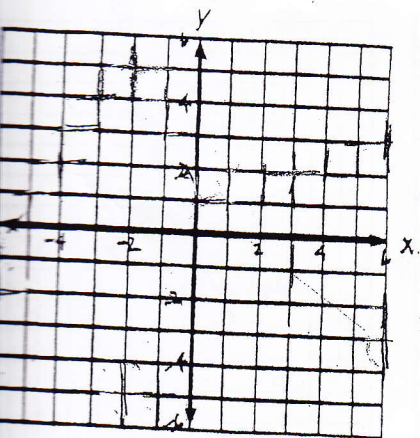
Given $y = f(x)$. Sketch the graph of the following:

a) $y = f(-x)$



b) $y = -f(x)$

c) $x = f(y)$



8. If (x, y) is a point on the graph of...	...what is the corresponding point on the graph of...	Answer :
a) $y = f(x)$	$y-1 = f\left(\frac{1}{3}x\right)$	
b) $y = \sqrt{x}$	$3y = \sqrt{x+4}$	
c) $y = x^3$	$y = (x-6)^3 + 2$	
d) $x^2 + y^2 = 9$	$(4x)^2 + (y+8)^2 = 9$	
e) $y = f(x)$	$y = f^{-1}(x-5)$	
f) $y = 5^x$	$y = -5^{7x}$	
g) $y = \sin x$	$y+2 = \sin \frac{1}{3}x$	
h) $y = f(x)$	$y = \frac{1}{f(x-4)}$	

9. If $(6, -2)$ is a point on the graph of $y = f(x)$, what is the corresponding point on the graph of:

a) $y = -4f(3x)$

c) $y = |f(6x+6)| - 3$

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

d) $y = 5f\left(\frac{1}{2}x+4\right)$

10. If $f(x) = mx + b$, what does $f^{-1}(f(x))$ equal?

11. Write an equation to represent the inverse $f^{-1}(x)$ of the following functions. (Solve for y.)

a) $f(x) = \sqrt{3-x}$

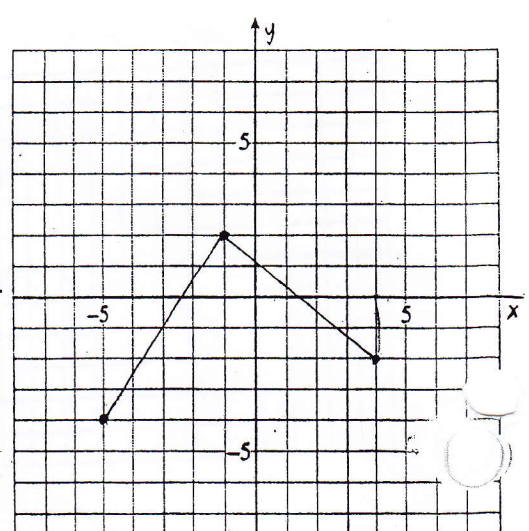
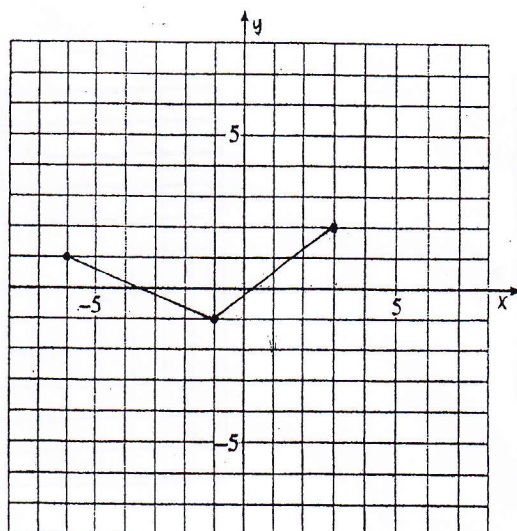
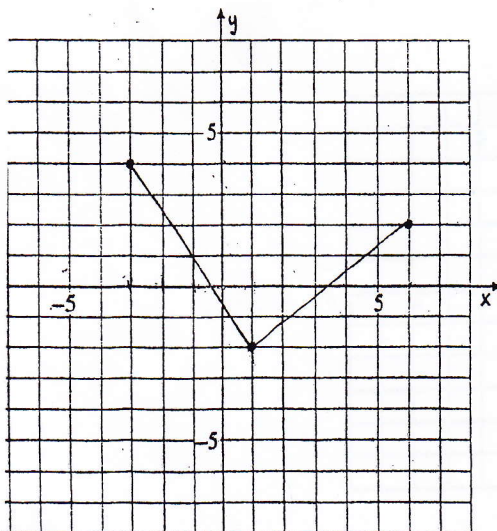
c) $f(x) = \sqrt[3]{x+1} - 2$

b) $f(x) = 3x^2 + 7$

d) $f(x) = \frac{ax}{c-bx}$

If necessary restrict the domain so the inverse is also a function.

12. Given $y = f(x)$. Determine an equation that represents the graph in diagram (a) and diagram (b).



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