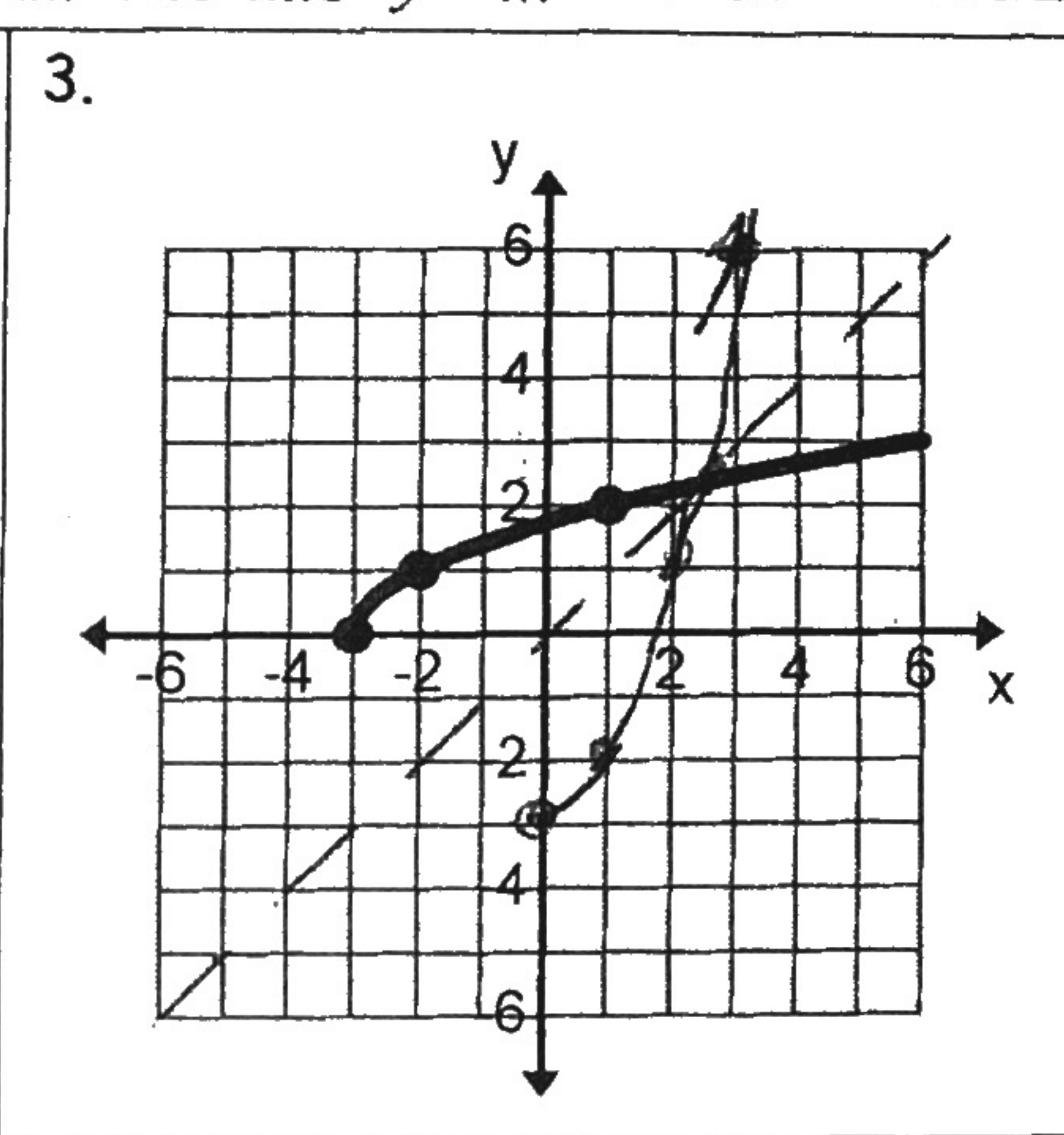
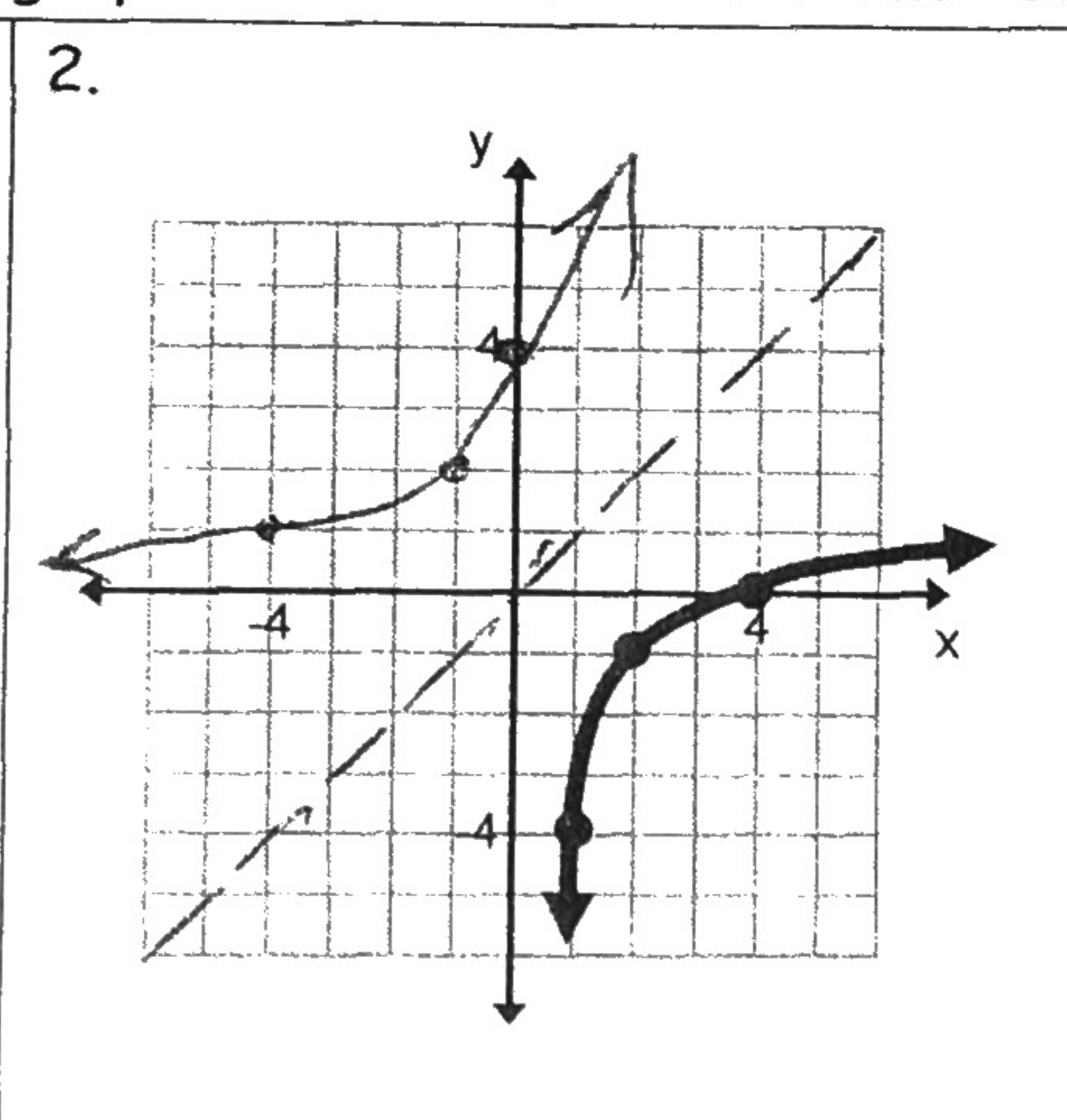
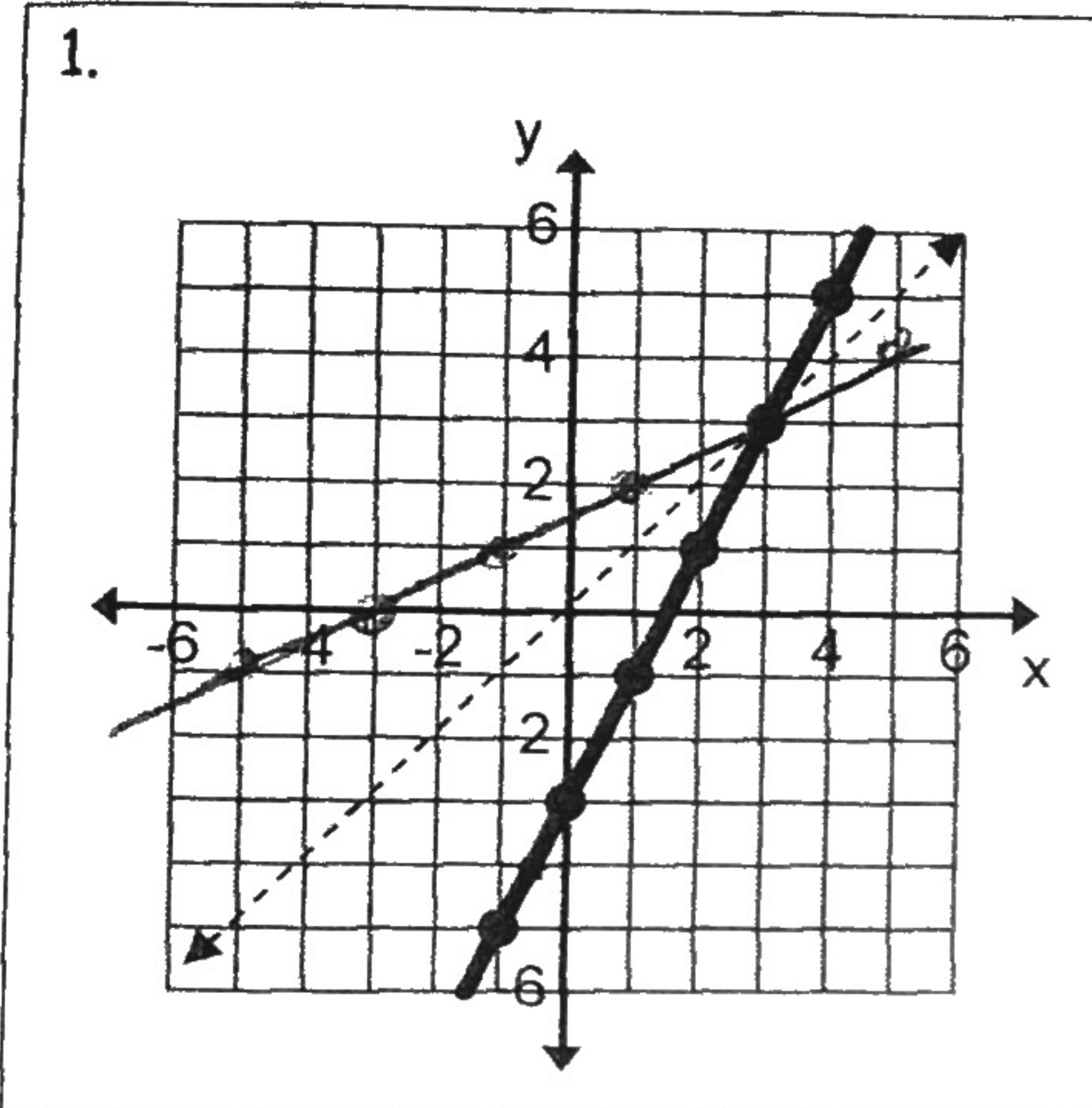


Use the graph of each function to graph its inverse function. Hint: Draw the line  $y=x$ .



Find  $f(g(x))$  and  $g(f(x))$  for each pair of functions:

4.  $f(x) = 3x - 4$ ,  $g(x) = x - 2$

$$f(g(x)) = f(x-2)$$

$$= 3(x-2) - 4$$

$$= 3x - 6 - 4$$

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

$$g(f(x)) = g(3x-4)$$

$$= 3x - 4 - 2$$

$$= 3x - 6$$

5.  $f(x) = x^2 - 4$ ,  $g(x) = x - 2$

$$f(g(x)) = f(x-2)$$

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

$$= x^2 - 4x + 4 - 4$$

$$= x^2 - 4x$$

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

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

$$= x^2 - 6$$

6.  $f(x) = x^2 + 3$ ,  $g(x) = \sqrt{x-5}$

$$f(g(x)) = f(\sqrt{x-5})$$

$$= (\sqrt{x-5})^2 + 3$$

$$= x - 5 + 3$$

$$= x - 2$$

$$g(f(x)) = g(x^2 + 3)$$

$$= \sqrt{(x^2 + 3) - 5}$$

$$= \sqrt{x^2 - 2}$$

Find the inverse of each function.

7.  $f(x) = 3x - 4$

$$y = 3x - 4$$

$$x = \frac{y+4}{3}$$

$f^{-1}(x) = \frac{x+4}{3}$  OR  $\frac{x}{3} + \frac{4}{3}$

8.  $f(x) = \sqrt[3]{x-4}$   $x \geq 4$

$$y = \sqrt[3]{x-4}$$

$$x = y^3 + 4$$

$$x^3 = y - 4$$

$f^{-1}(x) = x^3 + 4$

Fill in the following information for each graph. (Review)

9. Function? YES

Why or why not? PASSES VLT

Domain:  $(-6, \infty)$

Range:  $(-\infty, 2]$

Is the inverse a function? NO

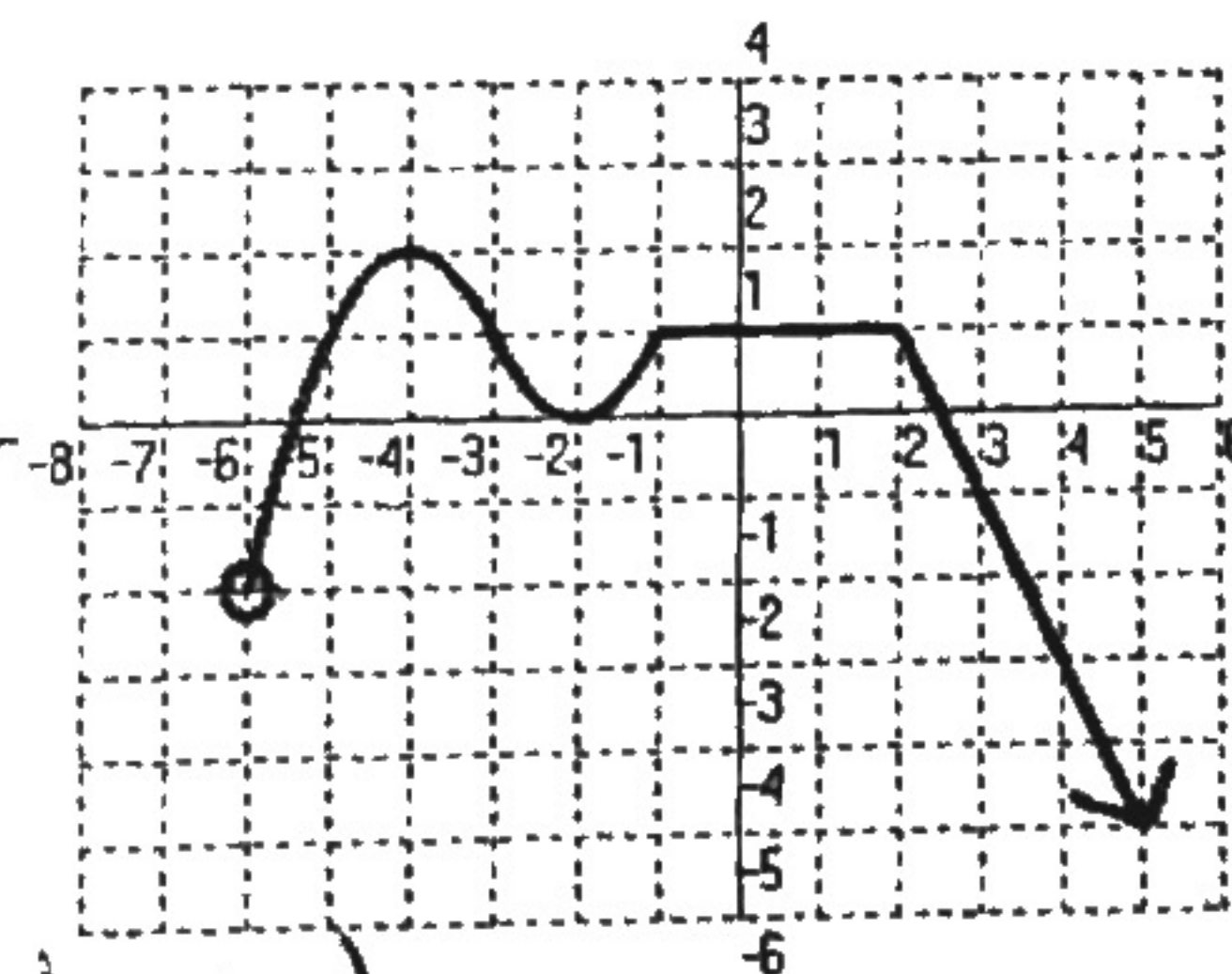
Why or why not? FAILS HLT

Domain of Inverse:  $(2, -\infty)$

Range of Inverse:  $(-6, \infty)$

Increasing over Interval(s)  $(-6, -4) \cup (-2, -1)$

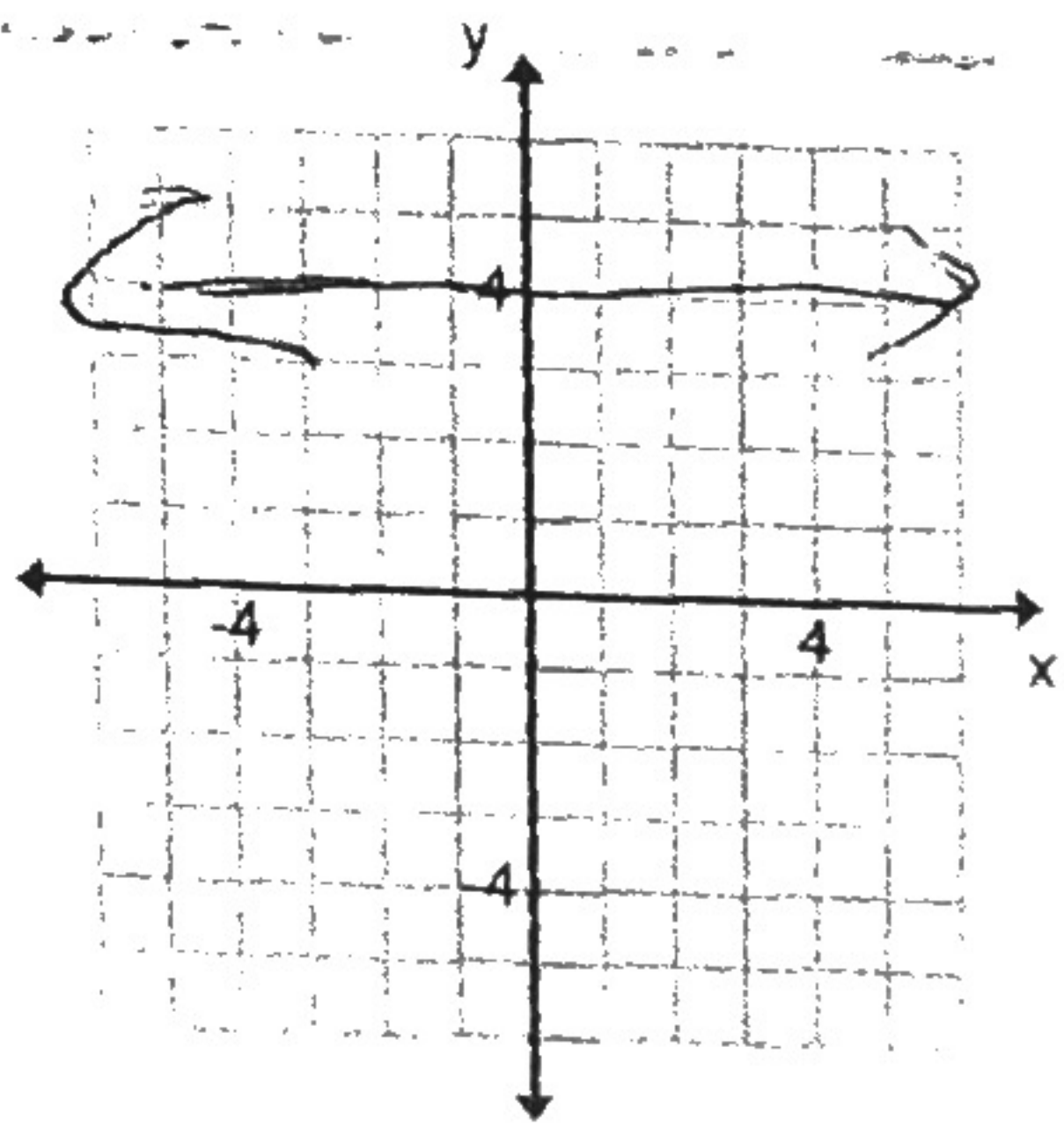
Decreasing over Interval(s)  $(-4, -2) \cup (2, \infty)$  Constant over Interval(s)  $(-1, 2)$



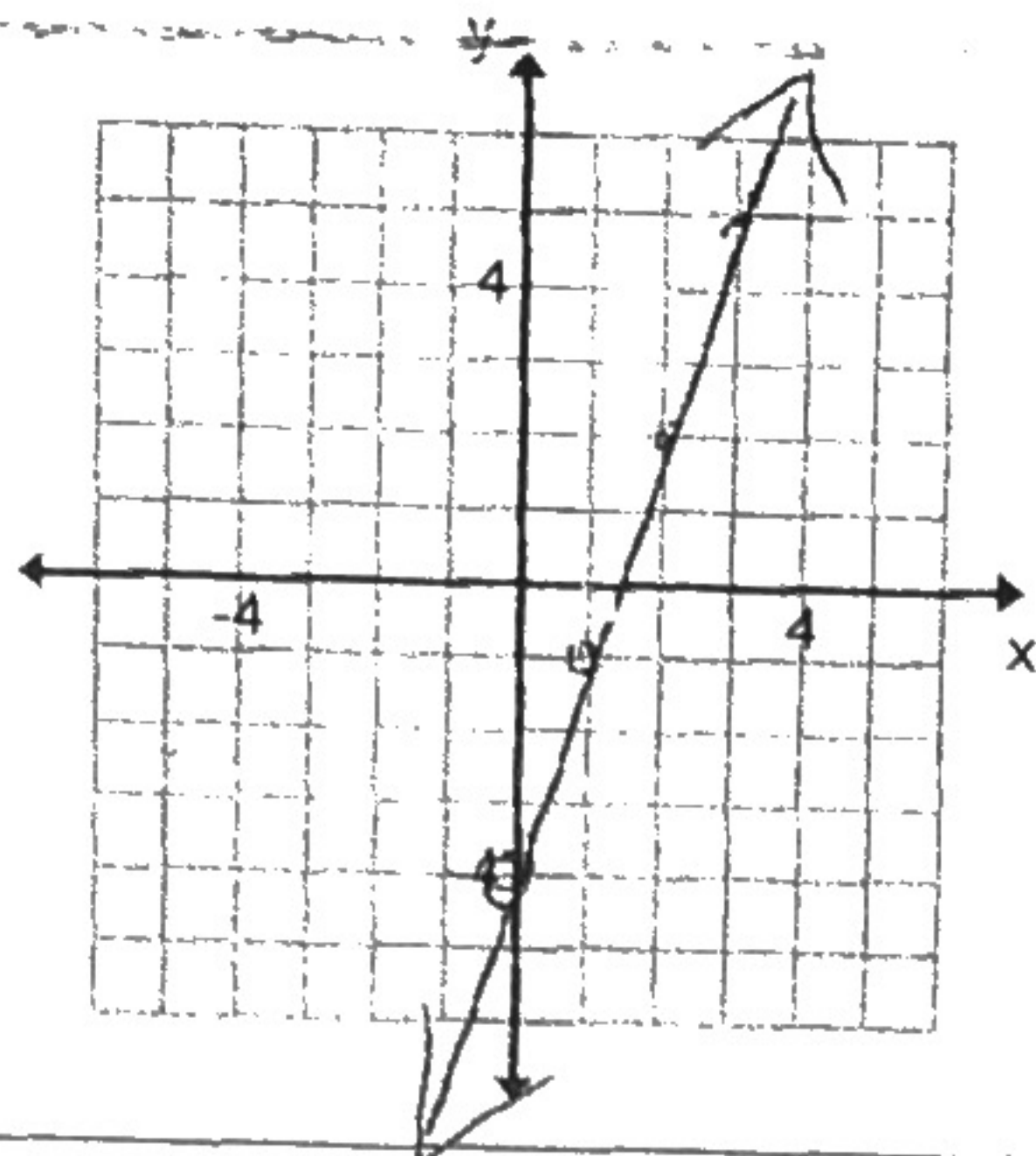


Graph each function WITHOUT the calculator. Identify the transformations of the parent graph.

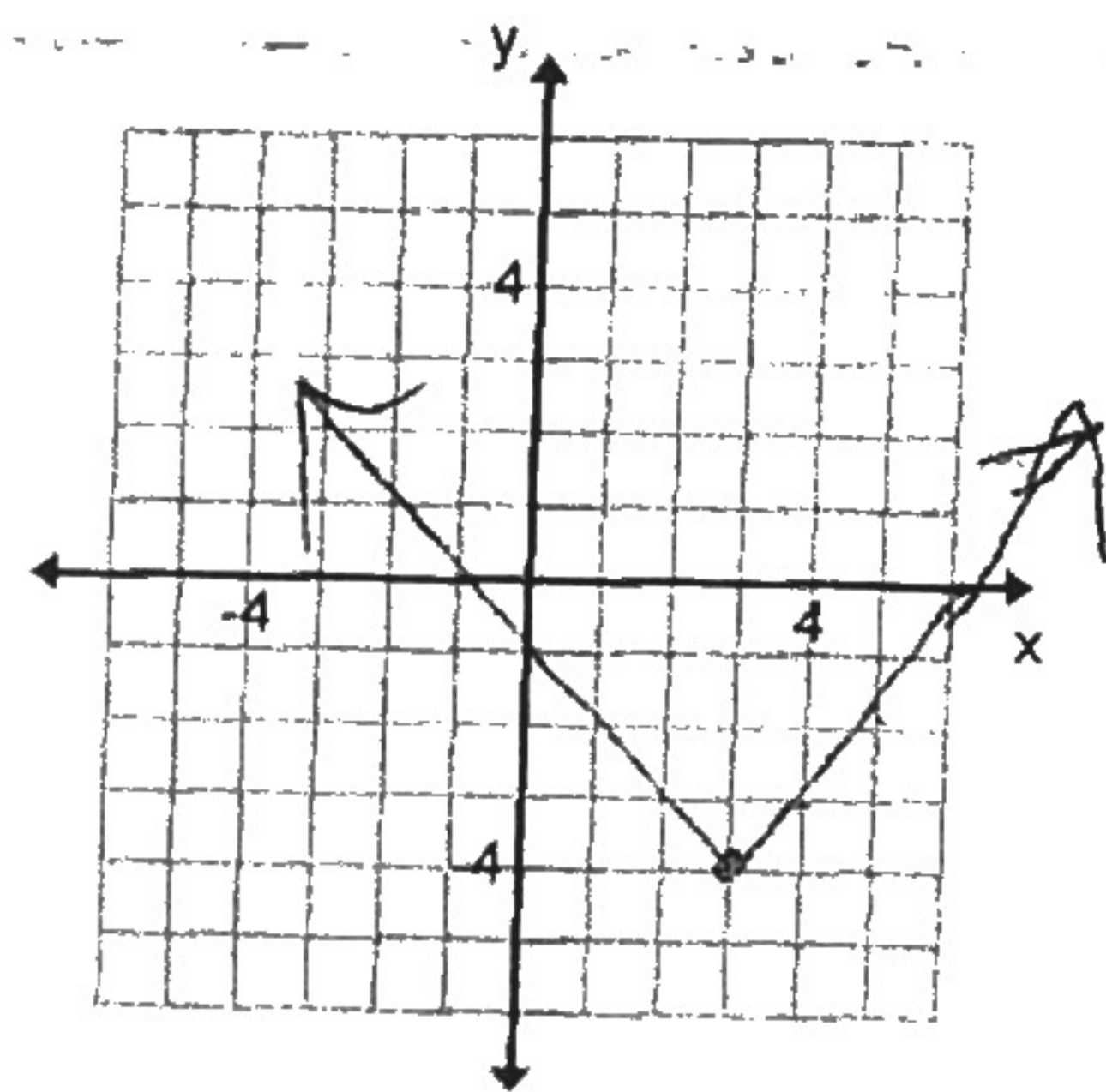
10.  $j(x) = 4$



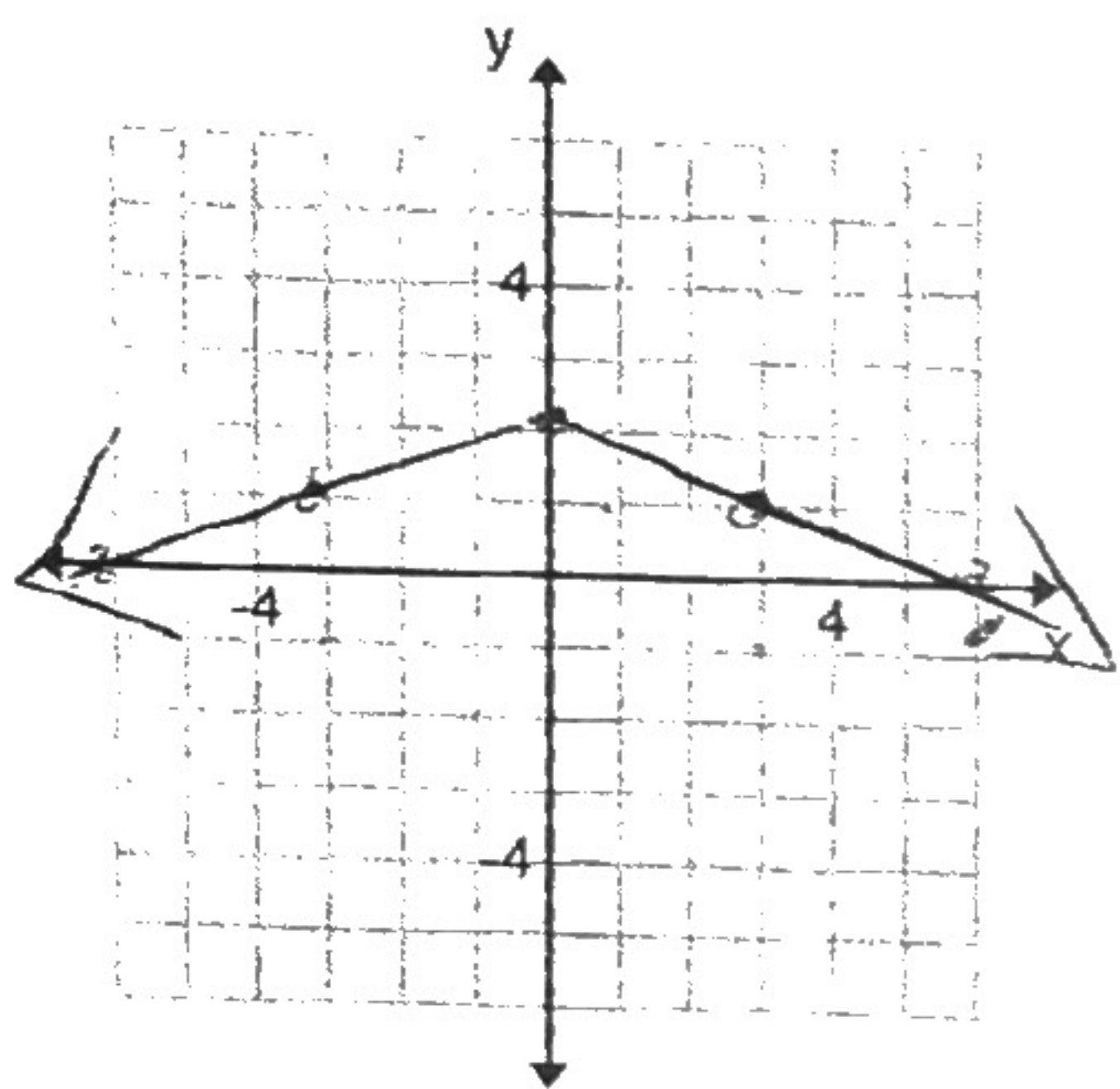
11.  $p(x) = 3x - 4$



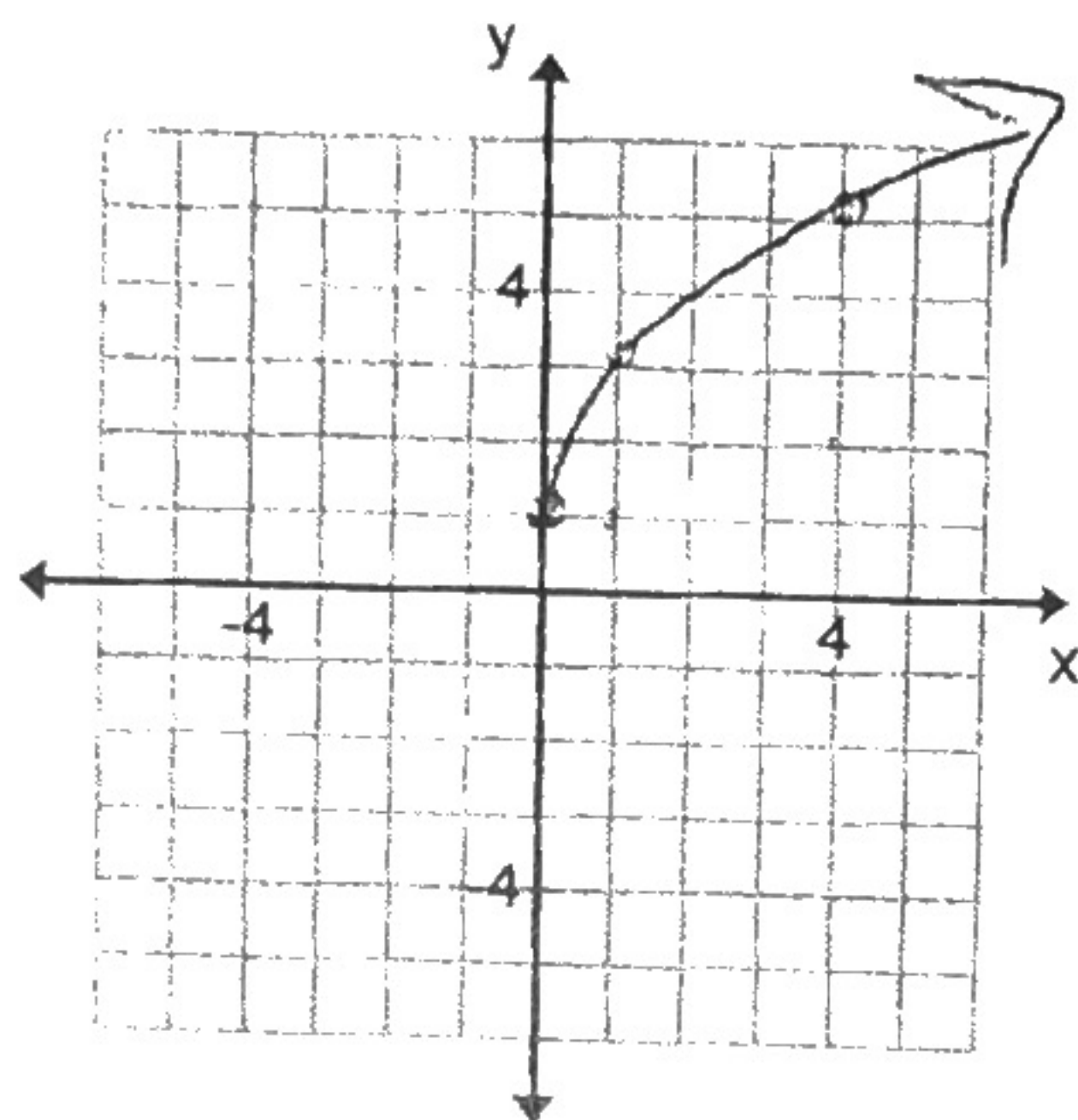
12.  $h(x) = |x - 3| - 4$



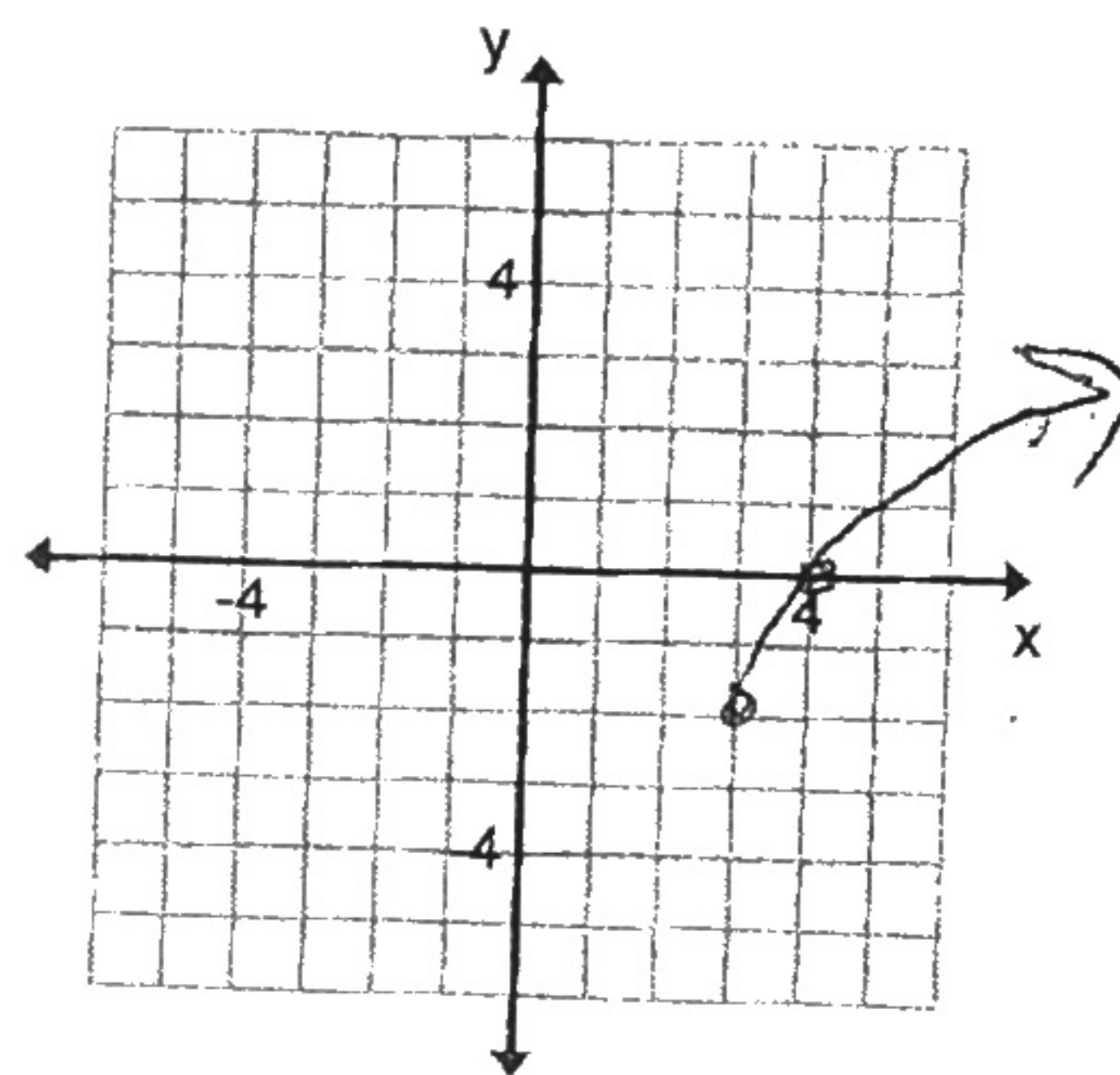
13.  $h(x) = -\frac{1}{3}|x| + 2$



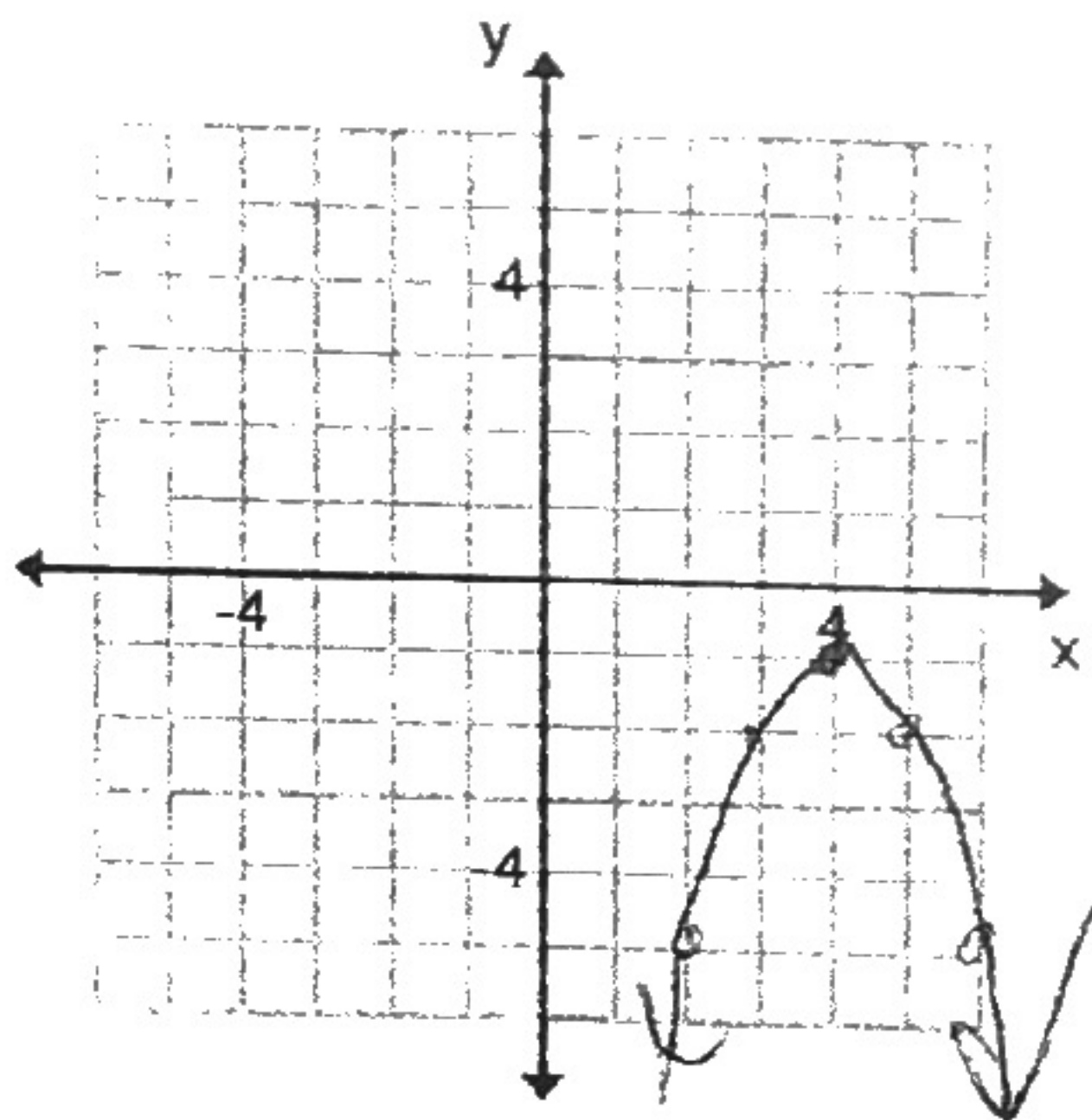
14.  $f(x) = 2\sqrt{x} + 1$



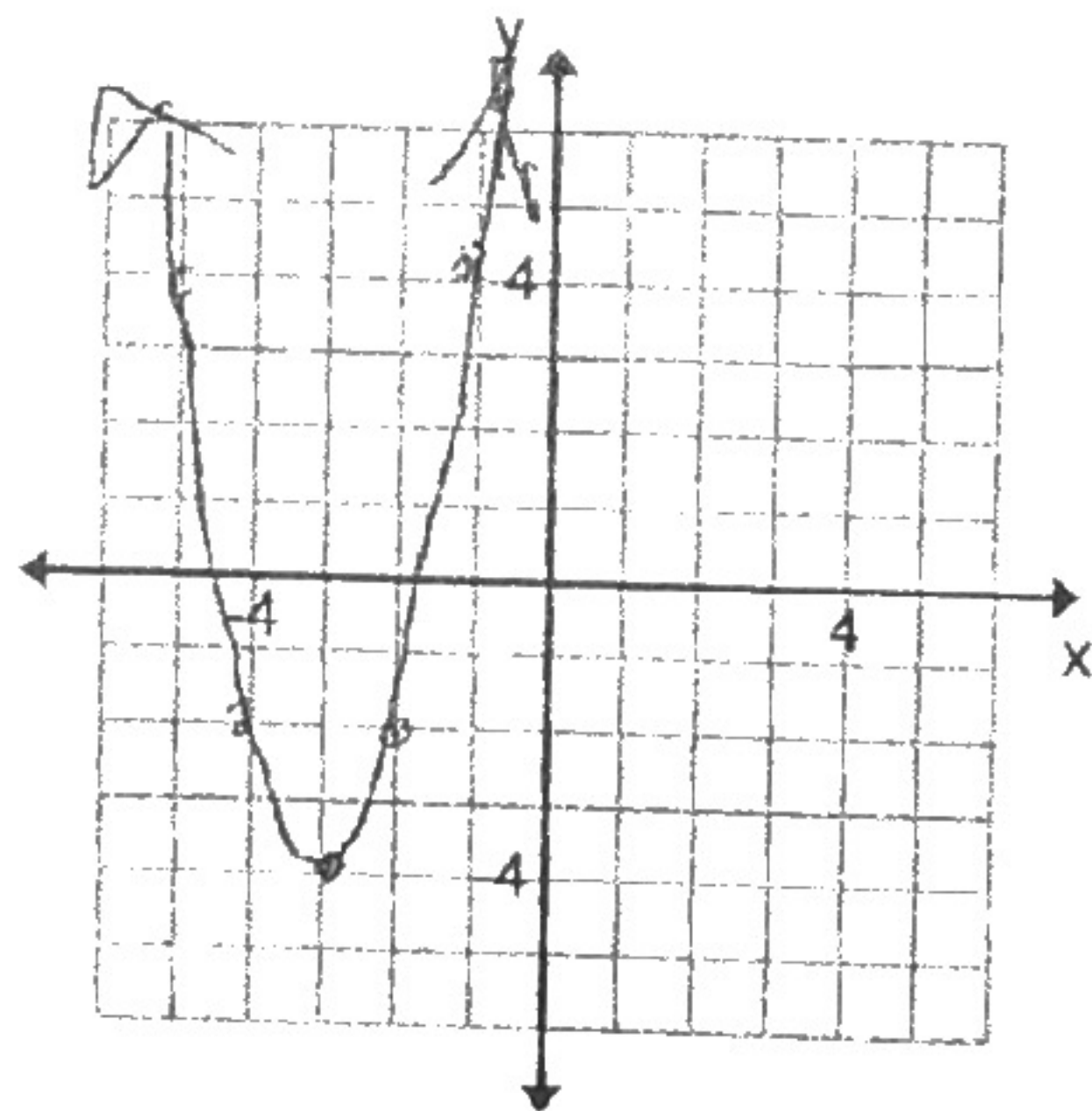
15.  $f(x) = 2\sqrt{x - 3} - 2$



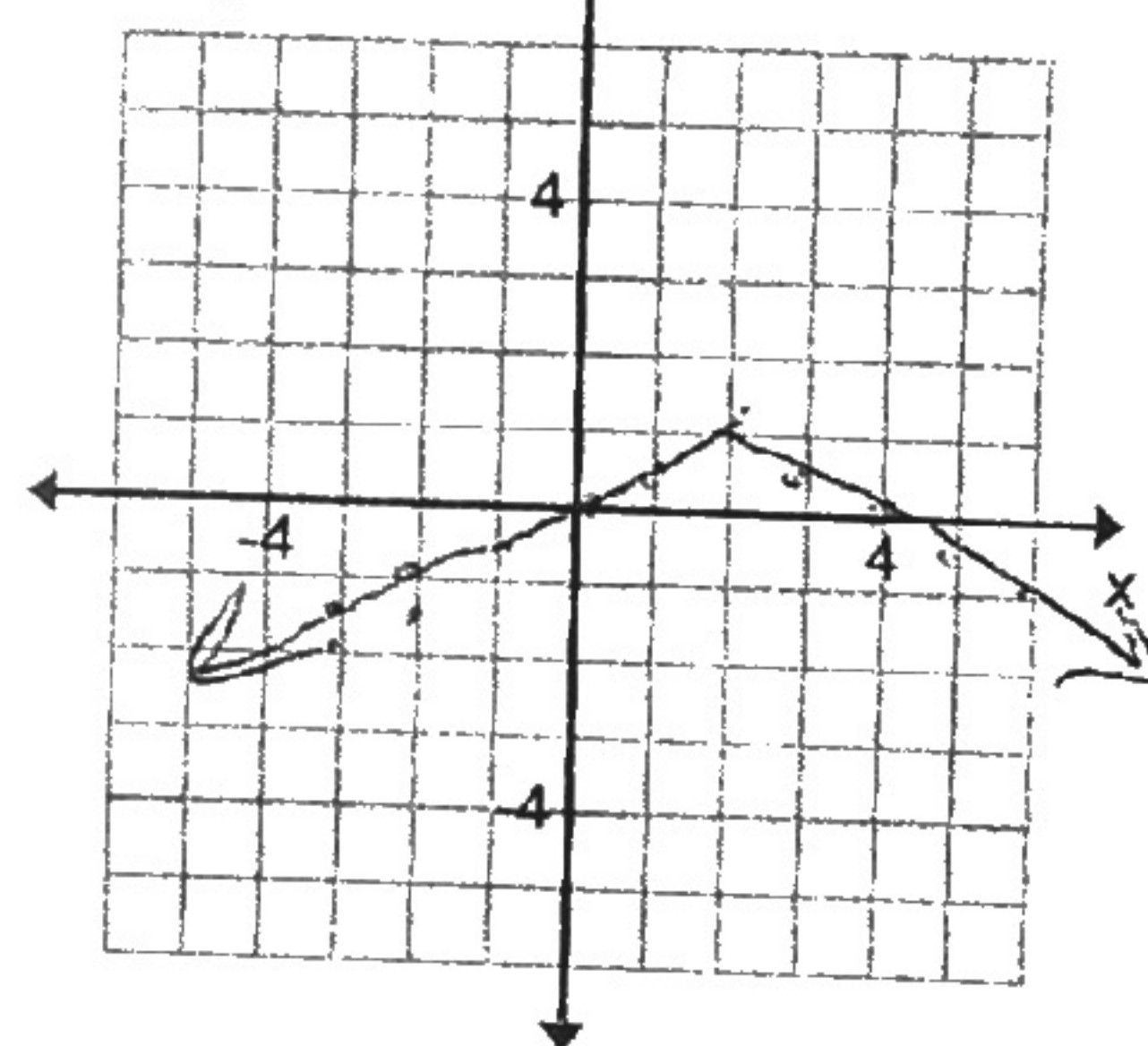
16.  $g(x) = -(x - 4)^2 - 1$



17.  $g(x) = 2(x + 3)^2 - 4$

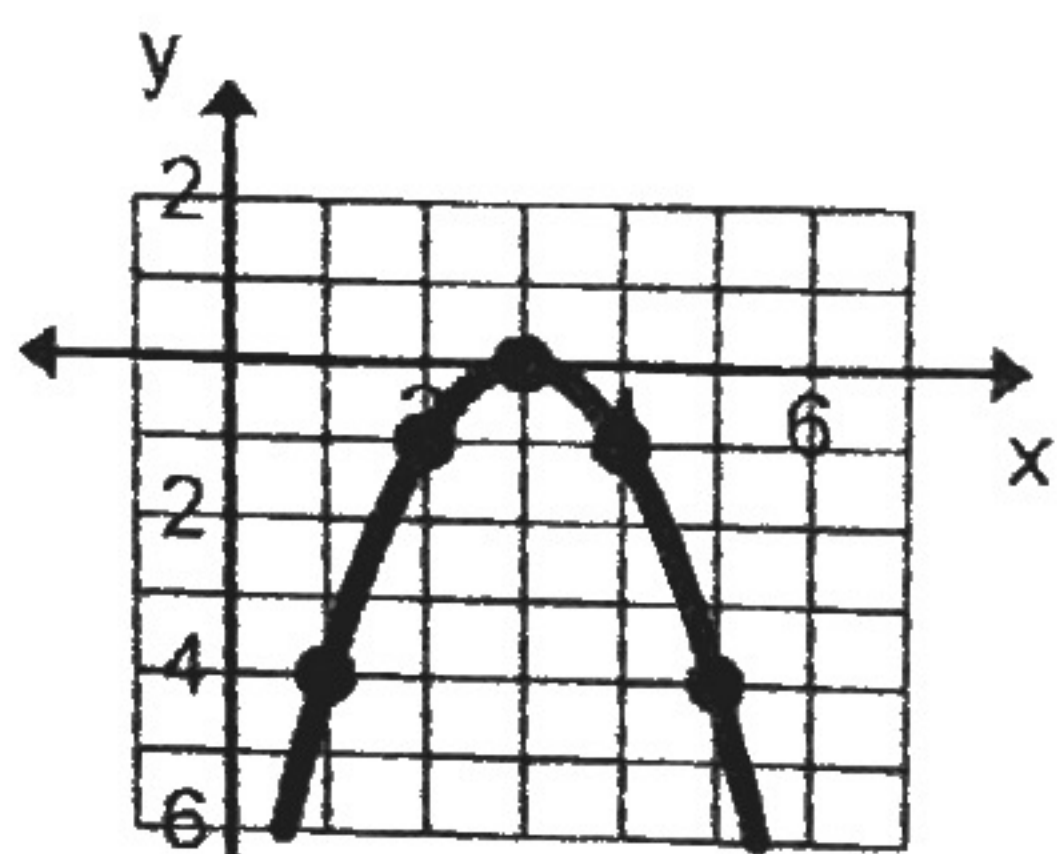


18.  $g(x) = -\frac{1}{2}|x - 2| + 1$



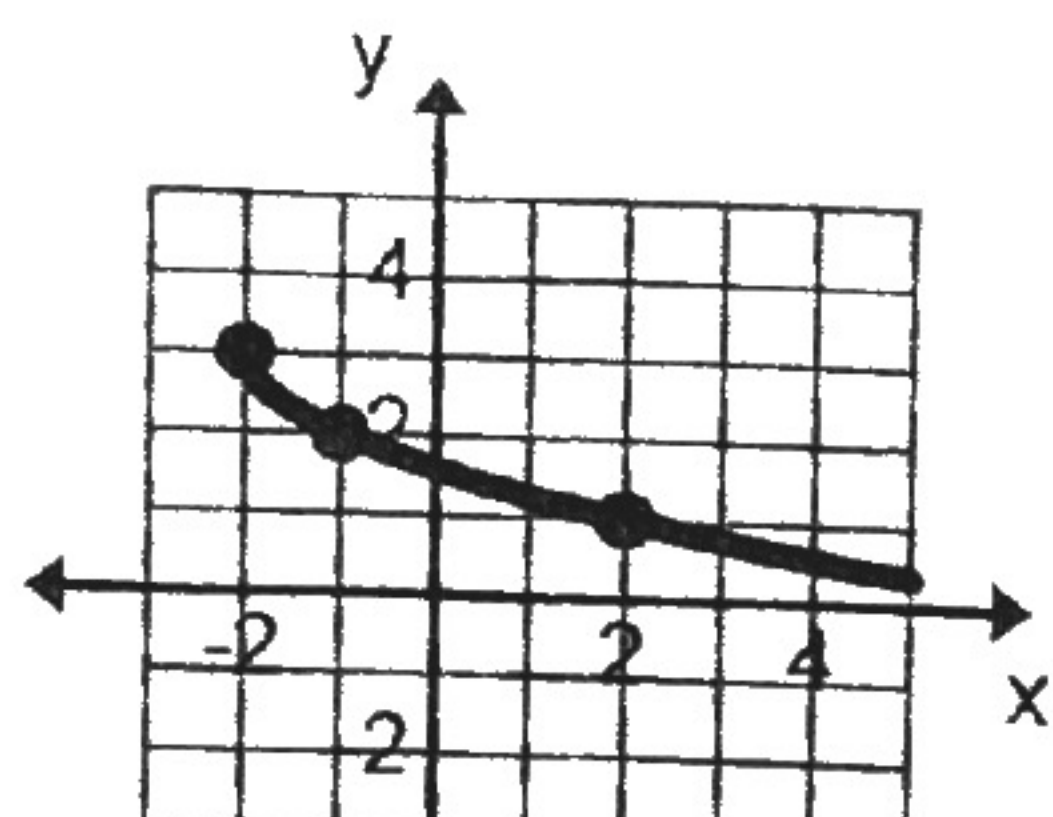
Write the equation of each graph and give the DOMAIN and RANGE. Beware of stretches and compressions!

19.



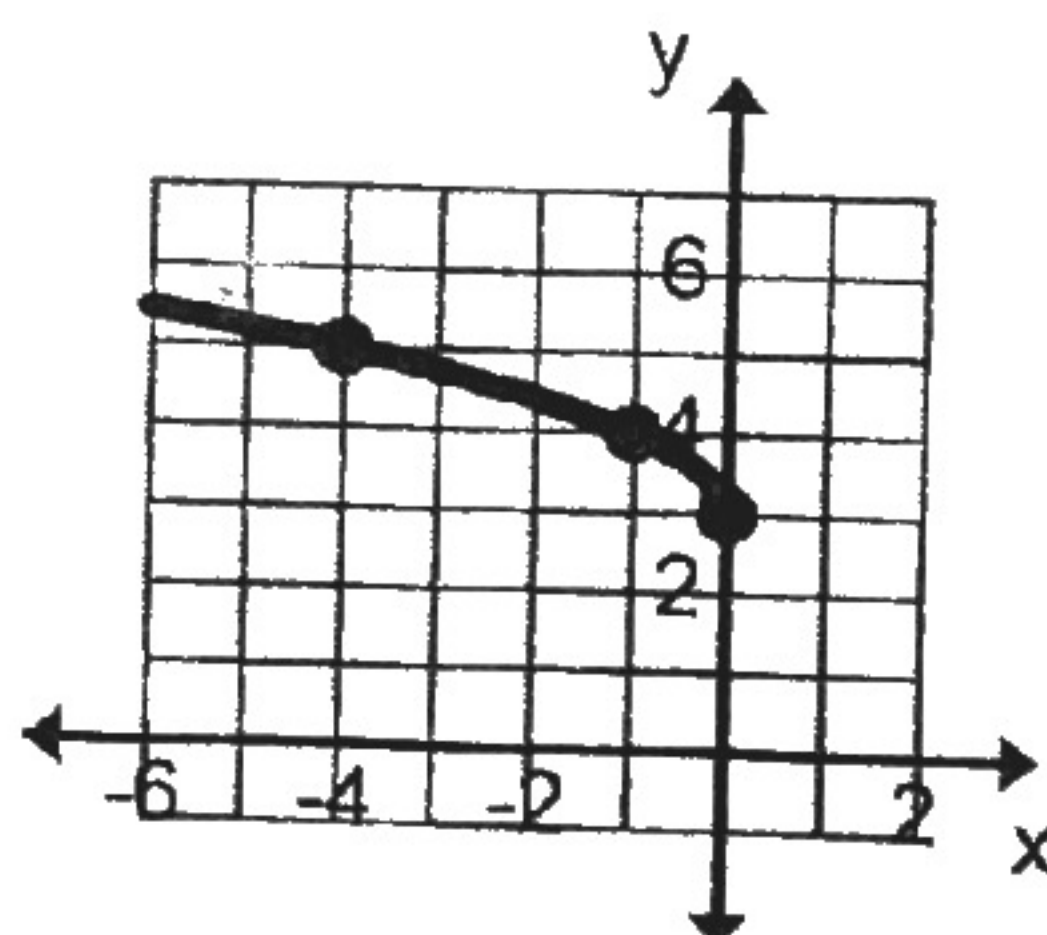
$f(x) = -(x - 3)^2$   
D:  $\mathbb{R}$  R:  $y \leq 0$

20.



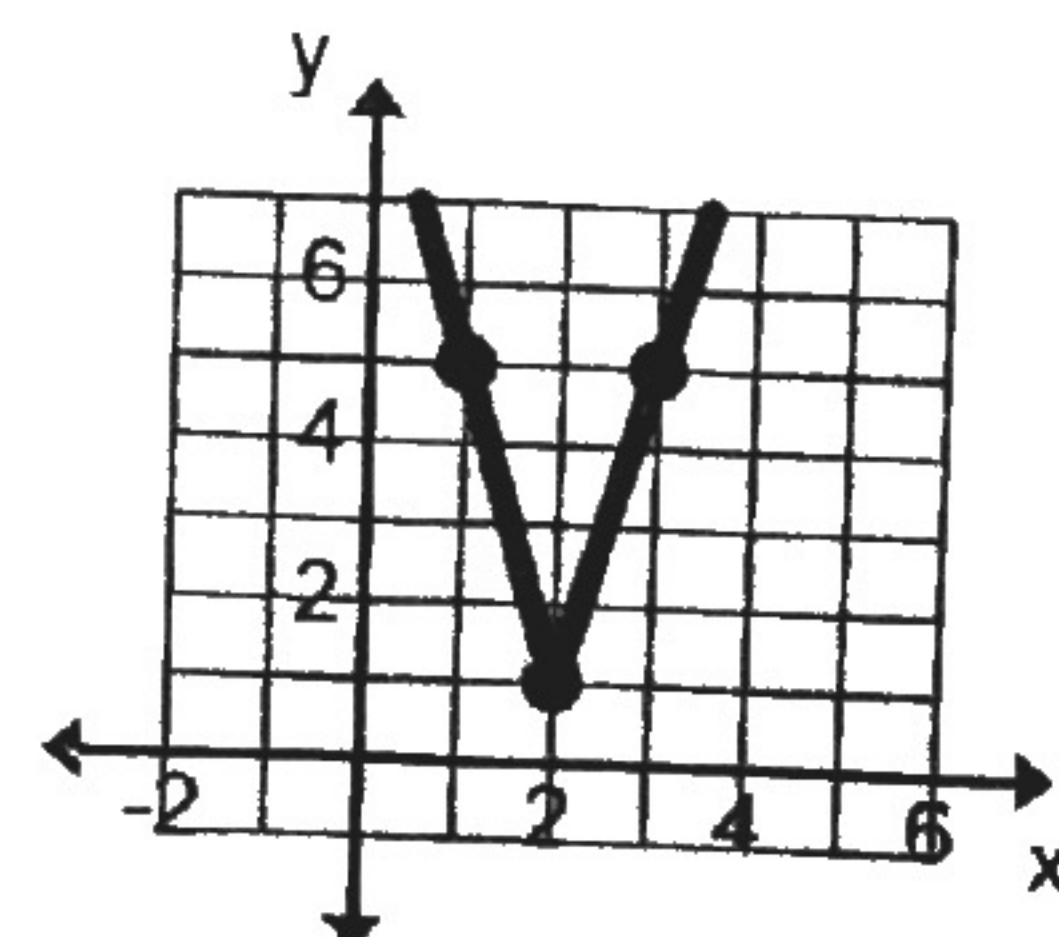
$f(x) = -(x + 1)^2 + 3$   
D:  $[-2, \infty)$  R:  $(-\infty, 3]$

21.



D:  $x \leq 0$  R:  $y \geq 3$

22.



D:  $(-\infty, \infty)$  R:  $[1, \infty)$