Inversions 30

In an **inversion** each point (x, y) of a relation becomes (y, x). That is, we replace x with y and y with x.

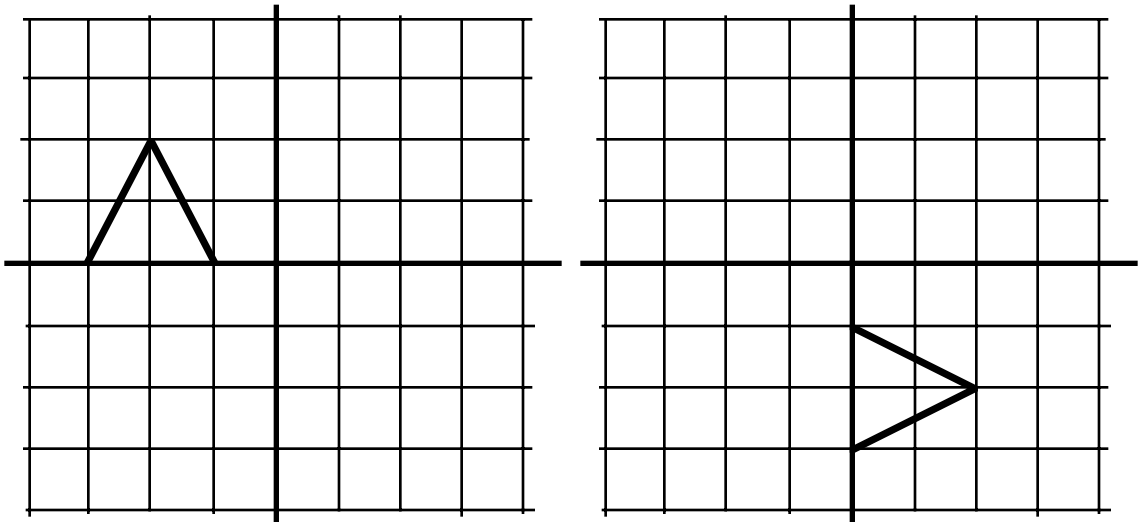
e.g. The inversion of (5, -2) is (-2, 5)

e.g. The inversion of $y = |x|$ is $x = |y|$

In an inversion, there is essentially a reflection about the line $y = x$.

e.g. The inversion of $y = f(x)$ is $x = f(y)$.

$y = f(x)$ $x = f(y)$



Problems:

1) Give the inverse relation for each of the following.

a) (-5, 1); (-3, 2); (-1, 3); (1, 4)

b) $y = x^2$

c) $y = \sqrt{(5 - x)}$

d) $y = 2x + 1$

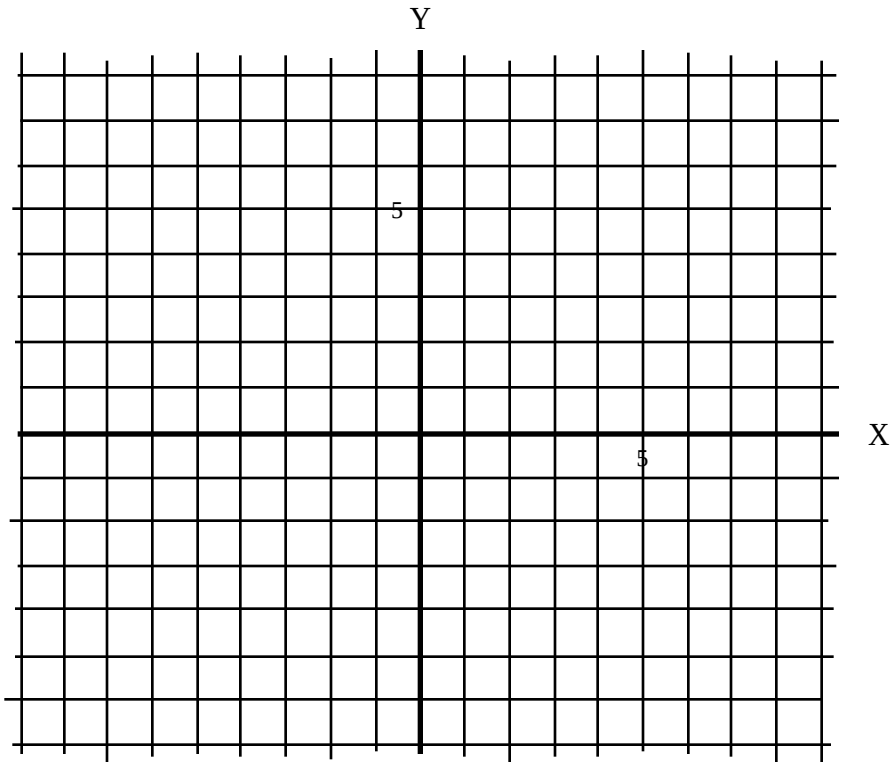
2) Graph each of the following relations and its inversion. (label the inversion "i")

a) $y = (x + 3)^2$

b) $y = - | x - 4 |$

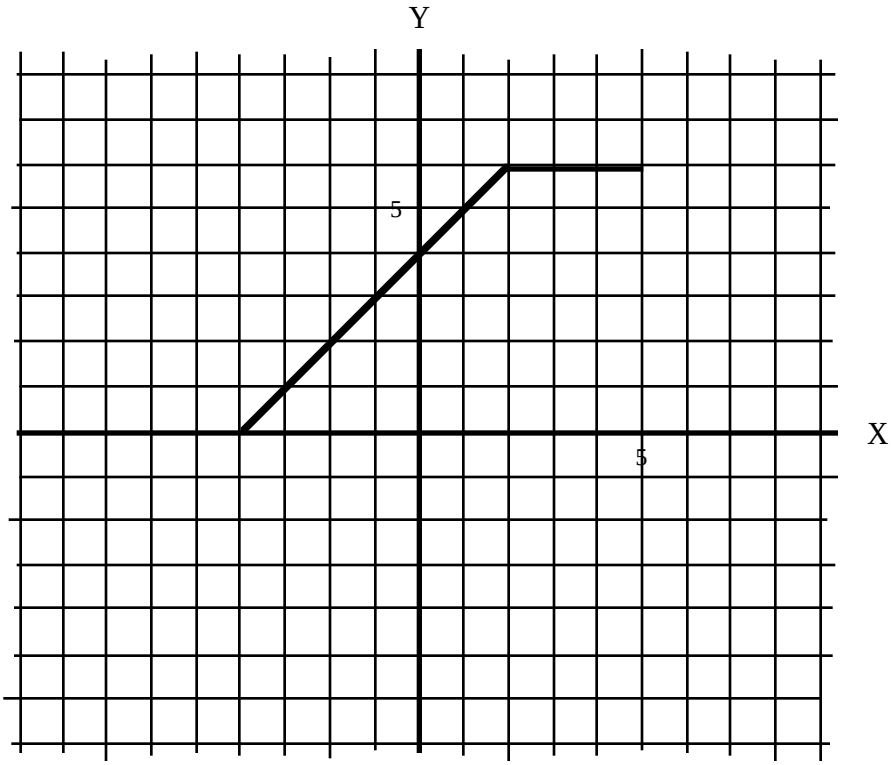
c) $y = (1/2)x + 3$

d) $y = \sqrt{(x)}$

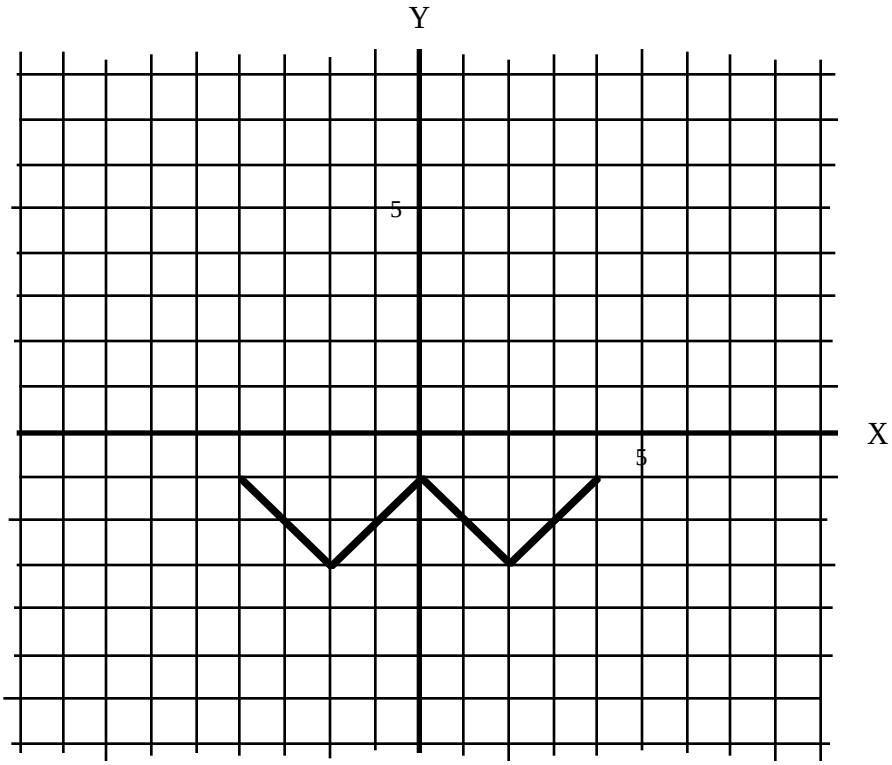


3) Graph the inversions.

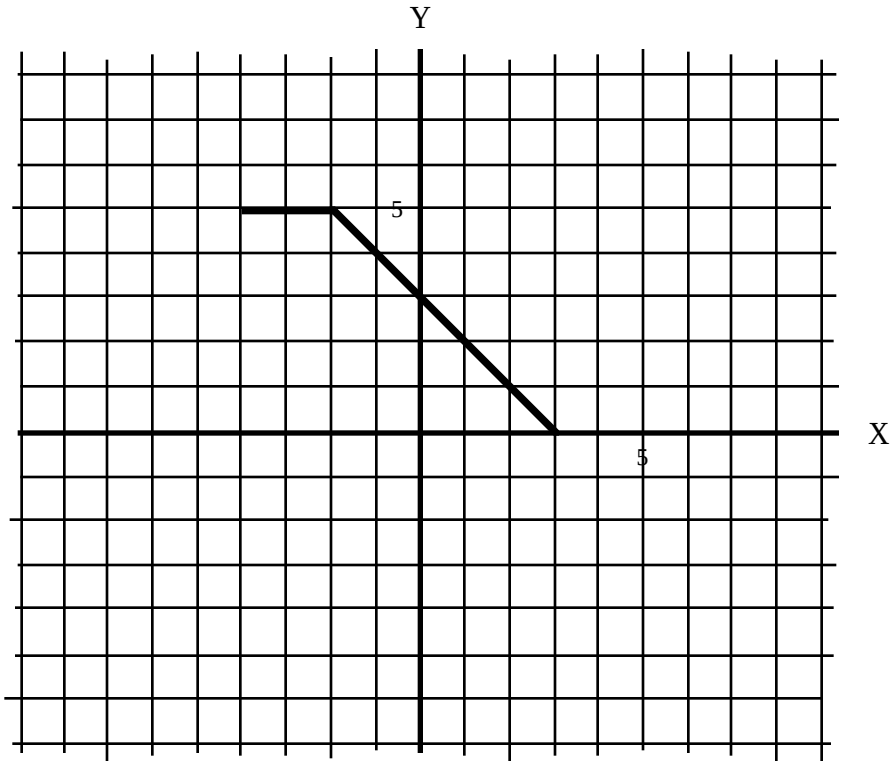
a)



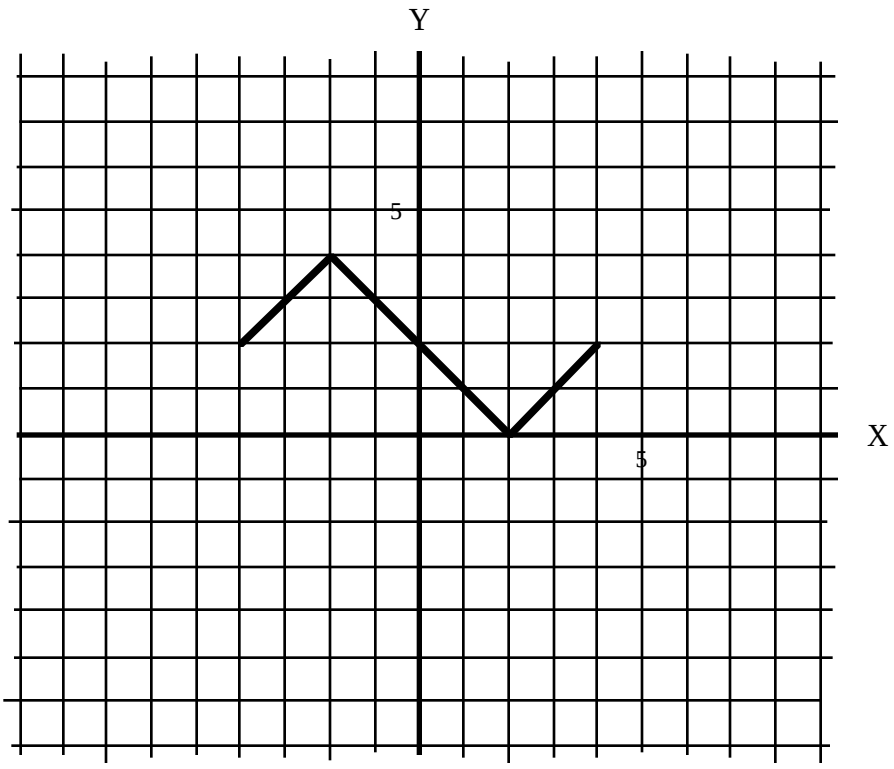
b)



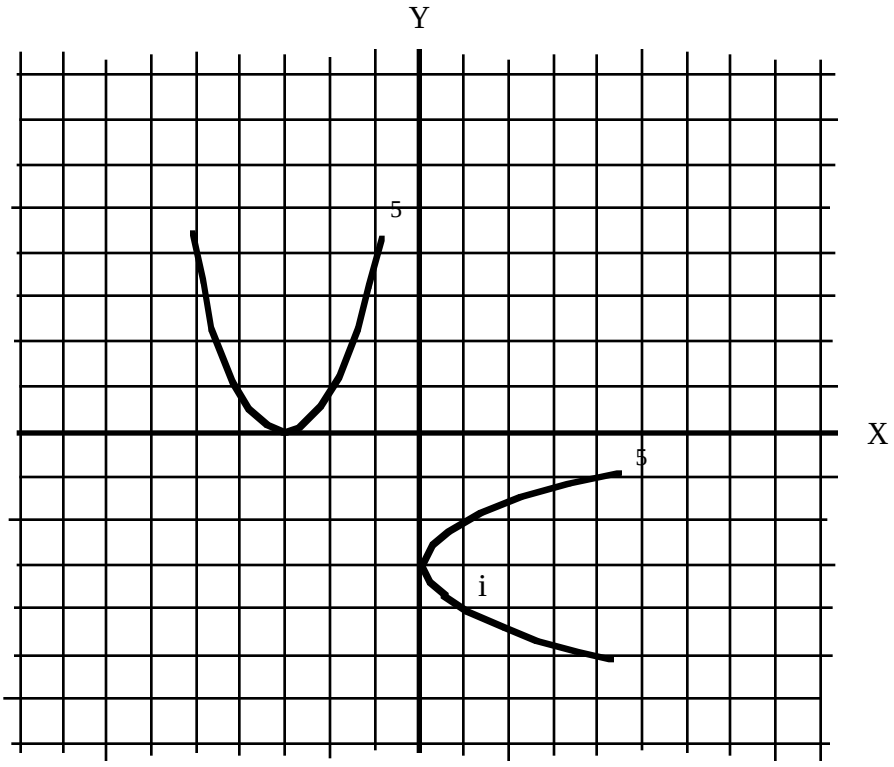
c)



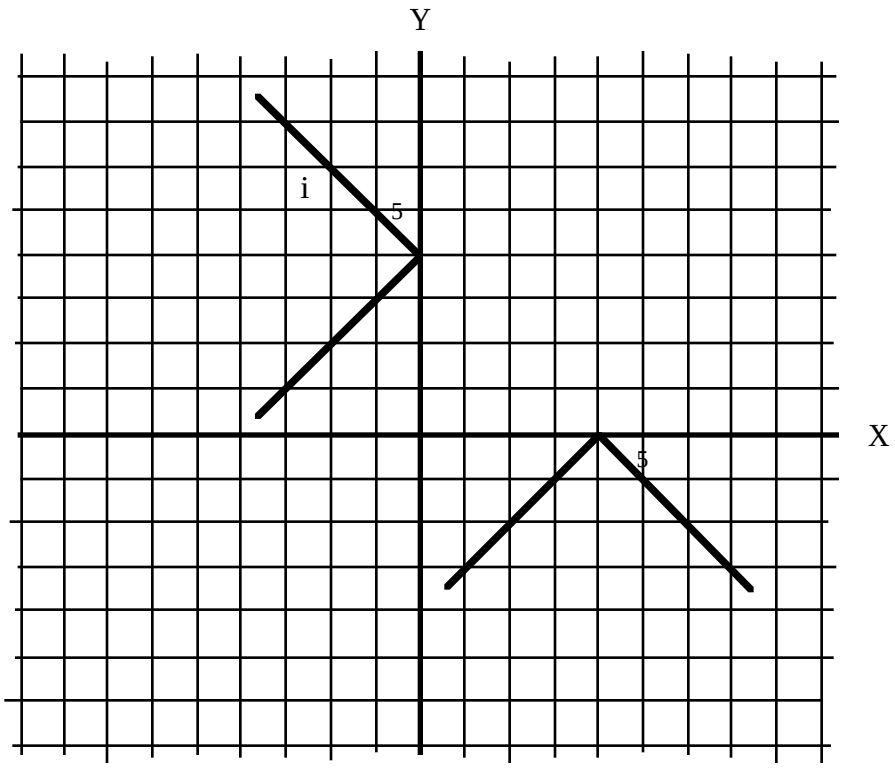
d)



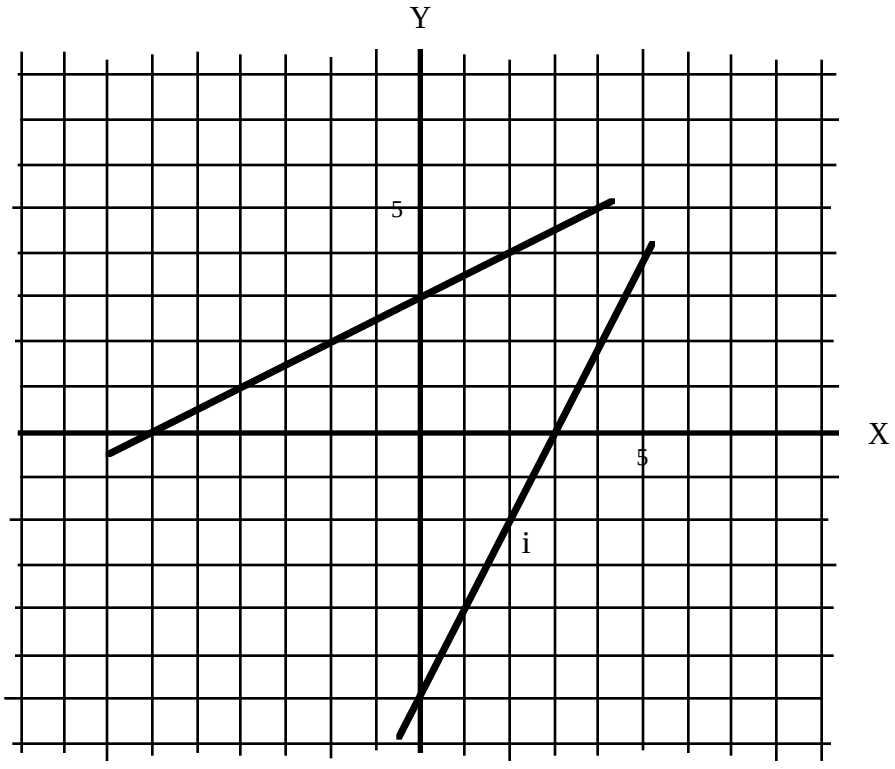
Answers: 1)a) (1, -5); (2, -3); (3, -1); (4, 1), b) $x = y^2$, c) $x = \sqrt{(5 - y)}$, d) $x = 2y + 1$, 2)a)



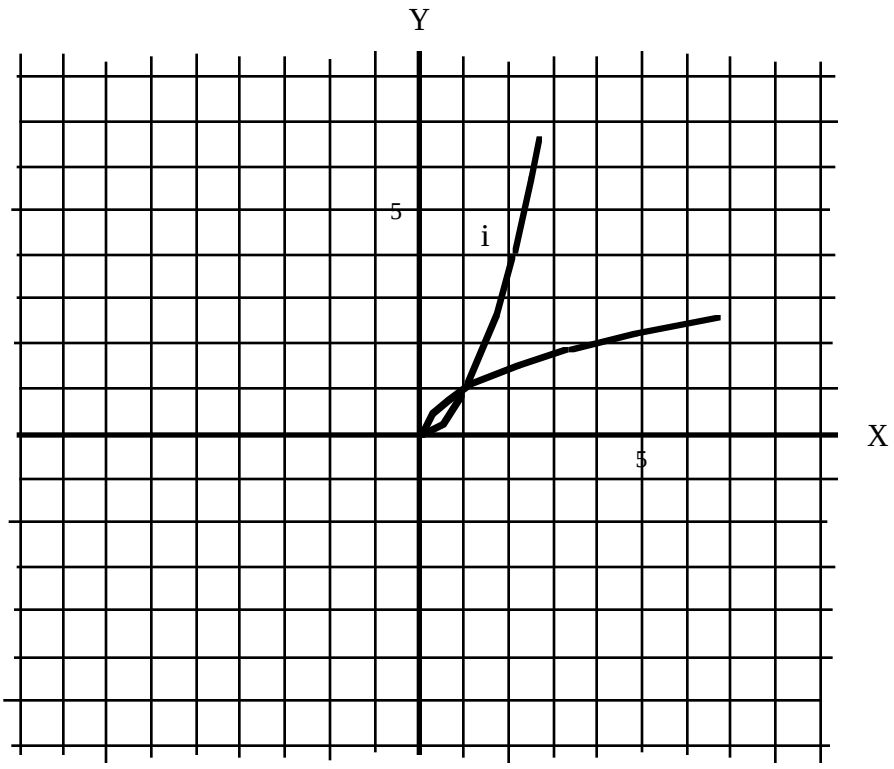
2)b)



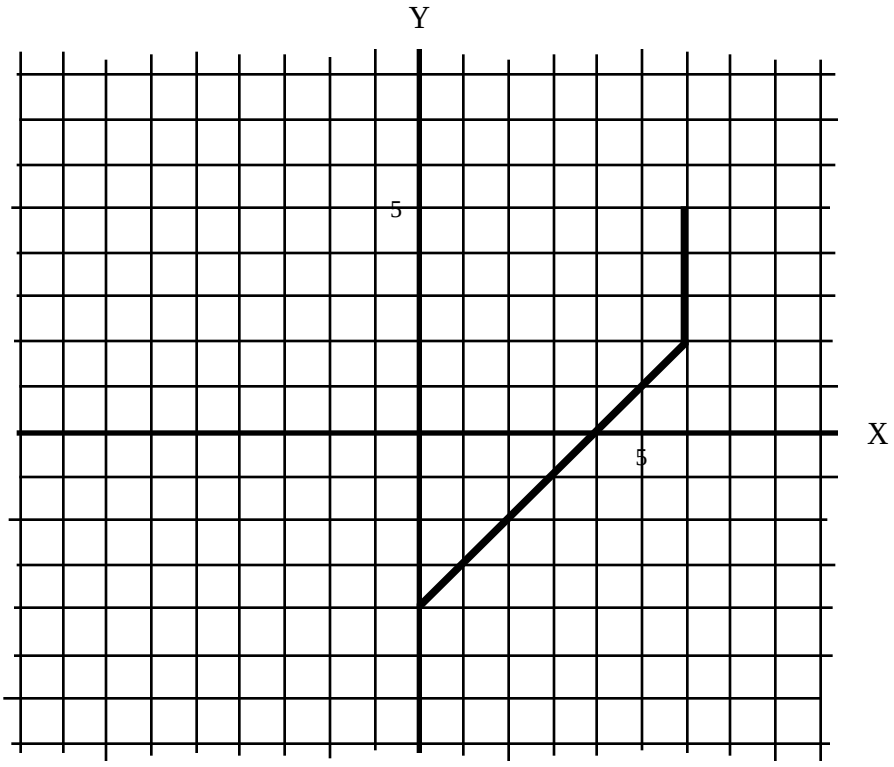
2)c)



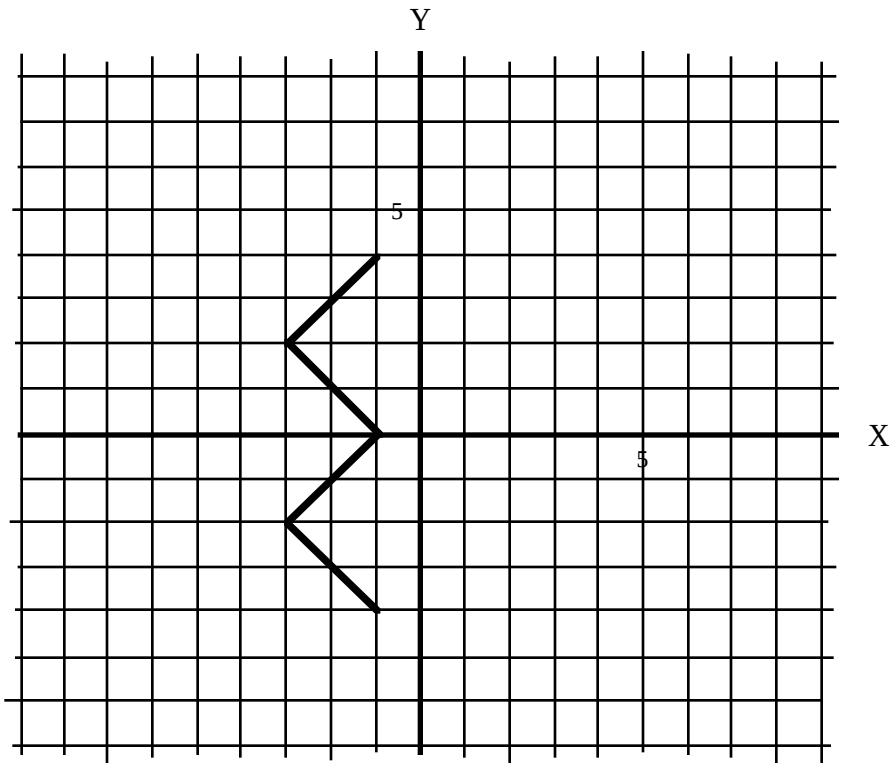
2)d)



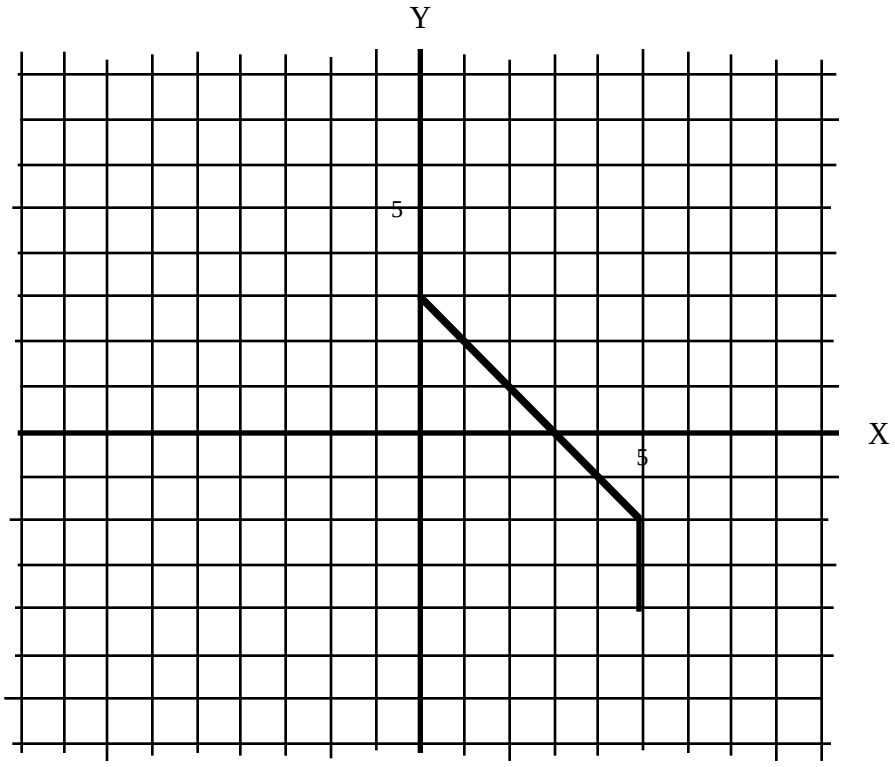
3)a



3)b)



3)c)



3)d)