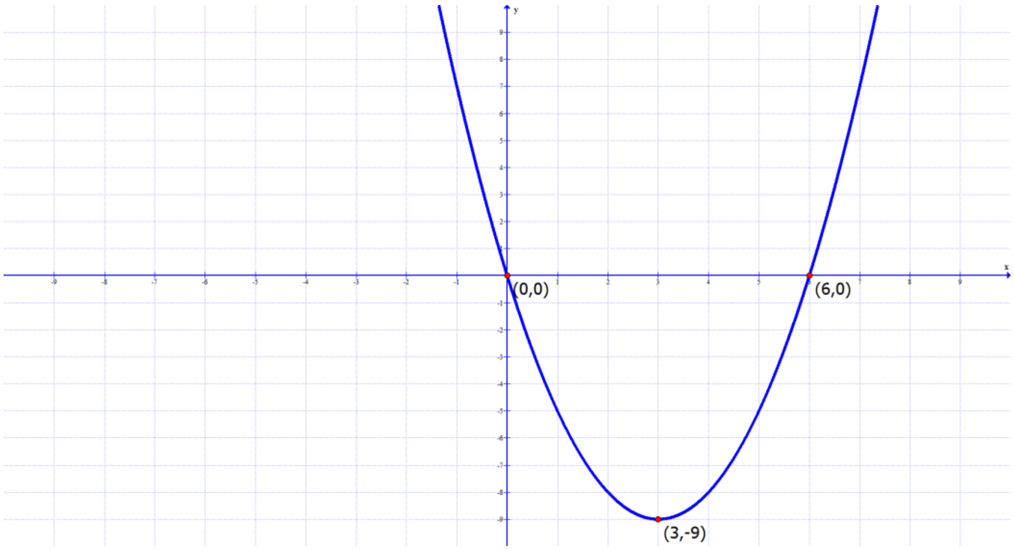
Section 2.1 Solutions:

1)

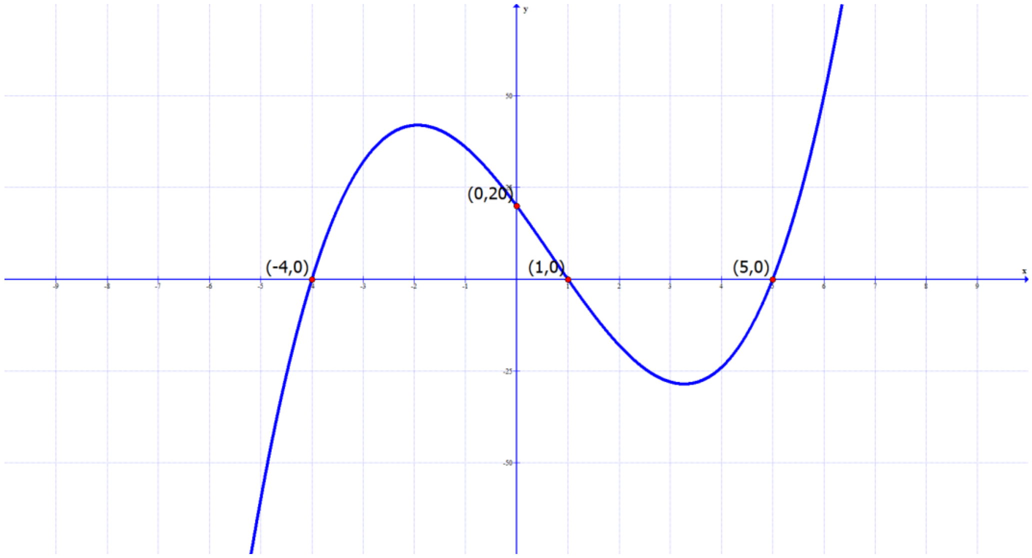


$x - intercepts\ are\ the\ points\ on\ the\ x - axis$

$y - intercept\ is\ the\ point\ on\ the\ y - axis$

x-intercepts $(0,0)\ and\ (6,0)$ $\quad y - intercept\ (0,0)$

3)



$x - intercepts\ are\ the\ points\ on\ the\ x - axis$

$y - intercept\ is\ the\ point\ on\ the\ y - axis$

x-intercepts $(-4,0)\ and\ (1,0)\ and\ (5,0)$ $\quad y - intercept\ (0,20)$

#5-12: Use Algebra to find the x and y-intercepts.

5) 3x - 6y = 24

X-Intercept

$3x - 6(0) = 24$

$\frac{3x}{3} = \frac{24}{3}$

$x = 8$

y-Intercept

$3(0) - 6y = 24$

$\frac{-6y}{-6} = \frac{24}{-6}$

$y = -4$

x-intercept $(8,0)$ $y-intercept\ (0,-4)$

7) $y^2 = x + 9$

X-Intercept

$(0)^2 = x+9$

$0 = x+9$

$-9 \quad -9$

$-9 = x$

y-Intercept

$y^2 = 0+9$

$y^2 = 9$

$\sqrt{y^2} = \pm\sqrt{9}$

$y = \pm 3$

y-INT Alternate approach

$y^2 = 0+9$

$y^2 = 9$

$-9 \quad -9$

$y^2 - 9 = 0$

$(y+3)(y-3) = 0$

$y+3=0 \quad y-3=0$

$-3 \ -3 \quad +3 \ +3$

$y=-3 \quad y=3$

x-intercept $(-9,0)$ $y-intercepts\ (0,3)\ and\ (0,-3)$

9) $y = x^2 + 4x - 5$

X-Intercept

$0 = x^2 + 4x - 5$

$0 = (x+5)(x-1)$

$x + 5 = 0$ $\quad$ $x - 1 = 0$

$-5 \; -5$ $\quad$ $+1 \; +1$

$x = -5$ $\quad$ $x = 1$

y-Intercept

$y = (0)^2 + 4(0) - 5$

$y = 0 + 0 - 5$

$y = -5$

x-intercepts $(-5,0)$ *and* $(1,0)$ $\quad$ $y - intercept\ (0,-5)$

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

X-Intercept

$x = (0)^2 - 6(0) + 8$

$x = 0 - 0 + 8$

$x = 8$

y-Intercept

$0 = y^2 - 6y + 8$

$0 = (y-2)(y-4)$

$y - 2 = 0$ $\quad$ $y - 4 = 0$

$+2 \; +2$ $\quad$ $+4 \; +4$

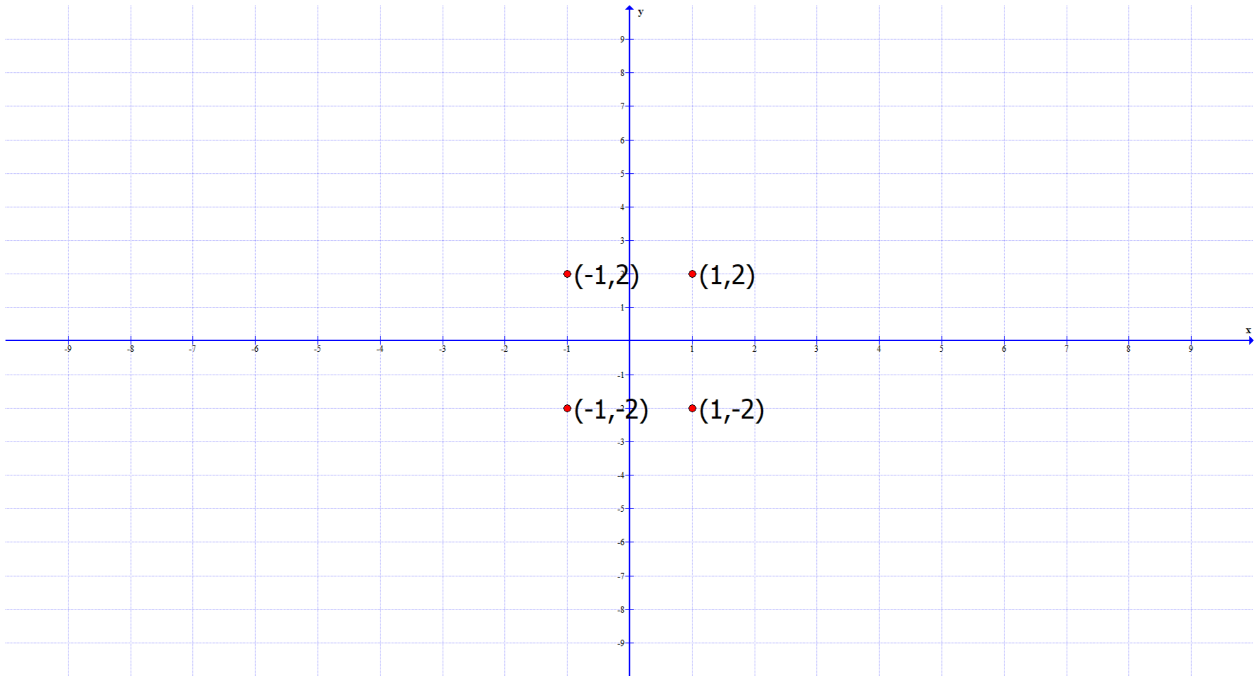
$y = 2$ $\quad$ $y = 4$

x-intercept $(8,0)$ $\quad$ $y - intercept\ (0,2)$ *and* $(0,4)$

13a) point $(1, -2)$ (change the sign of the y)

13b) point $(-1,2)$ (change the sign of the x)

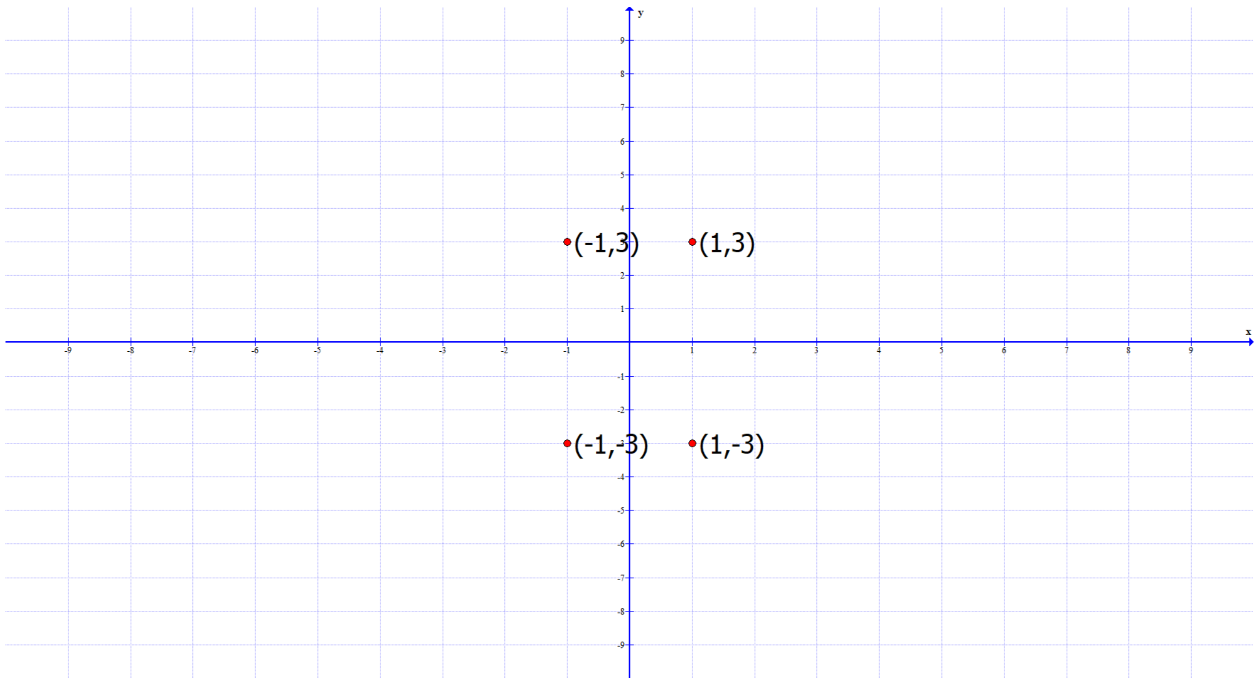
13c) point $(-1, -2)$ (change the sign of the x and the sign of the y)



15a) point $(-1,-3)$ (change the sign of the y)

15b) point $(1,3)$ (change the sign of the x)

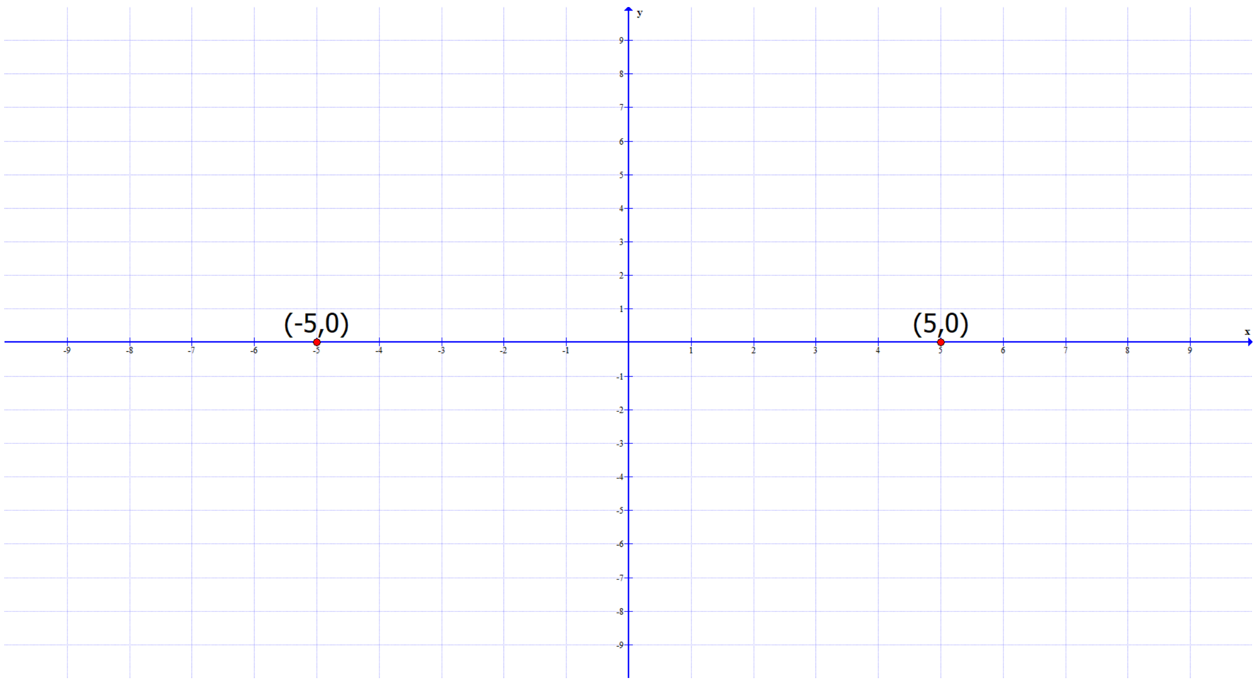
15c) point $(1,-3)$ (change the sign of the x and the sign of the y)



17a) point $(5,0)$ (change the sign of the y, $-0 = -1 * 0 = 0$)

17b) point $(-5,0)$ (change the sign of the x)

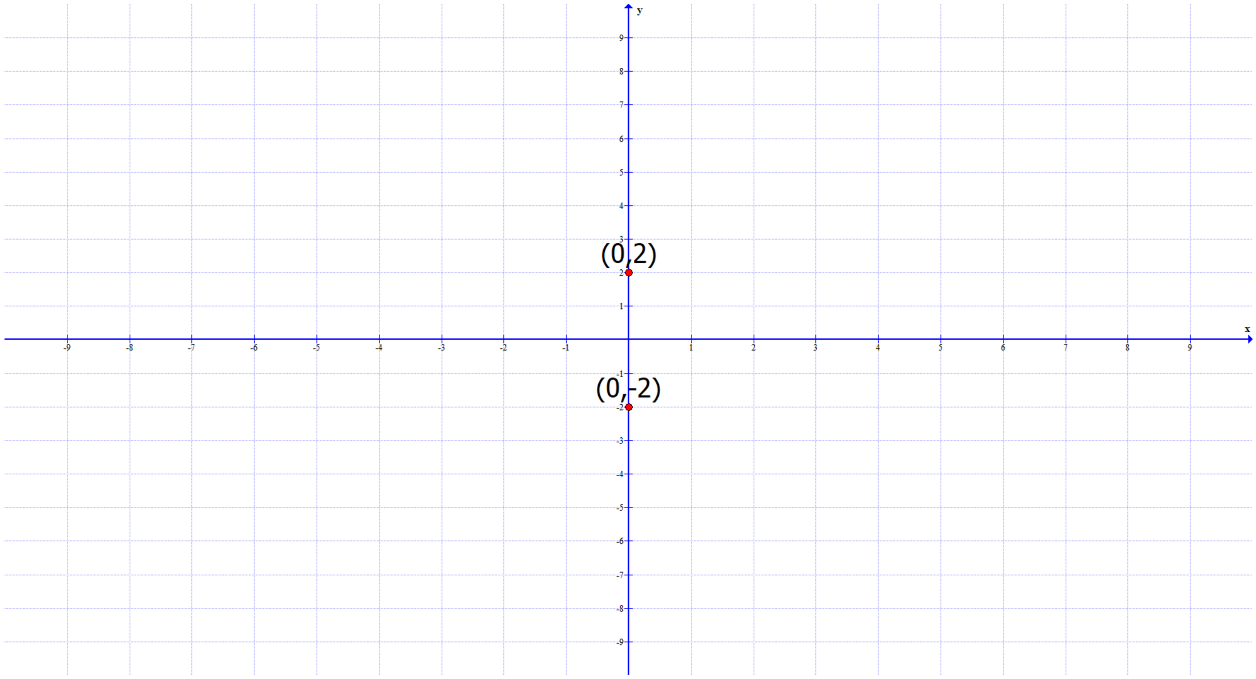
17c) point $(-5,0)$ (change the sign of the x and the sign of the y)



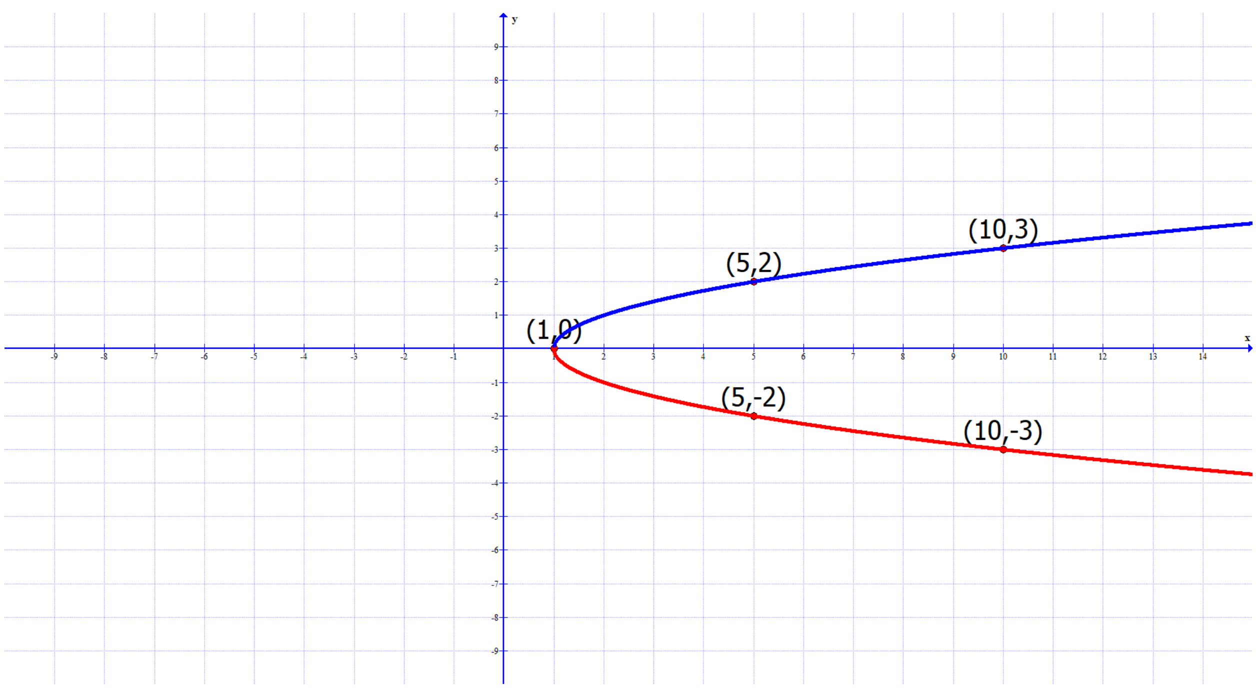
19a) point $(0,2)$ (change the sign of the y)

19b) point $(0,-2)$ (change the sign of the x, $-0 = 0$)

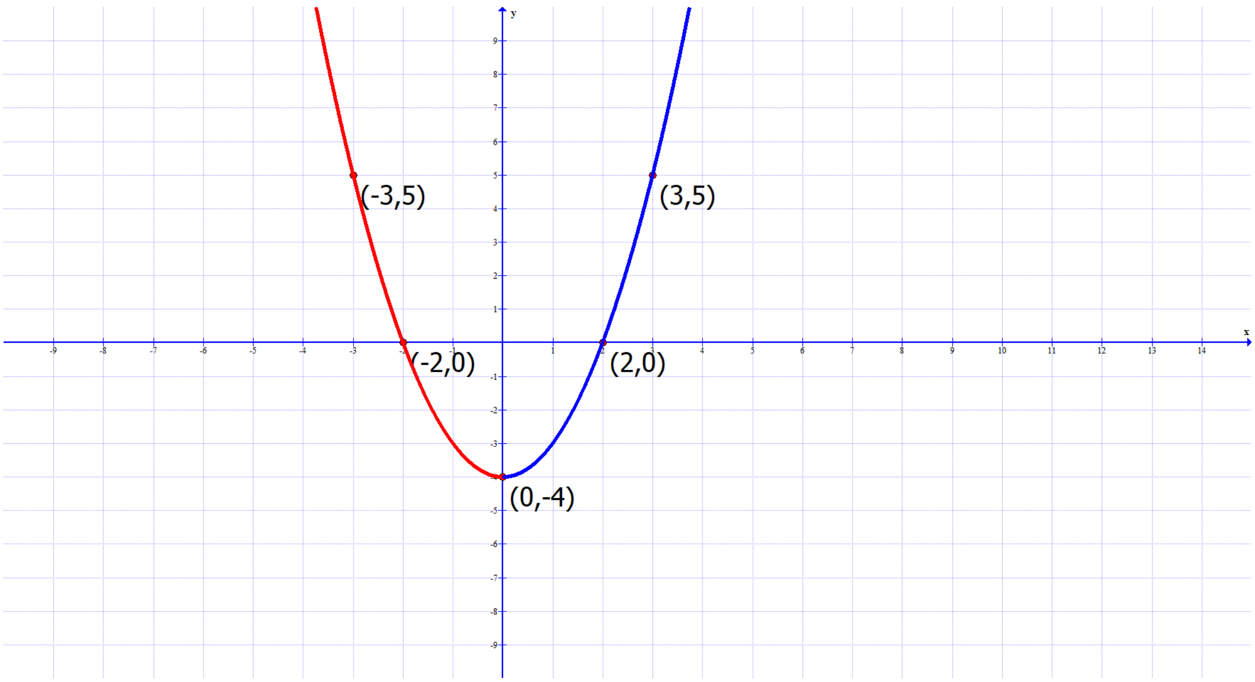
19c) point $(0,2)$ (change the sign of the x and the sign of the y)



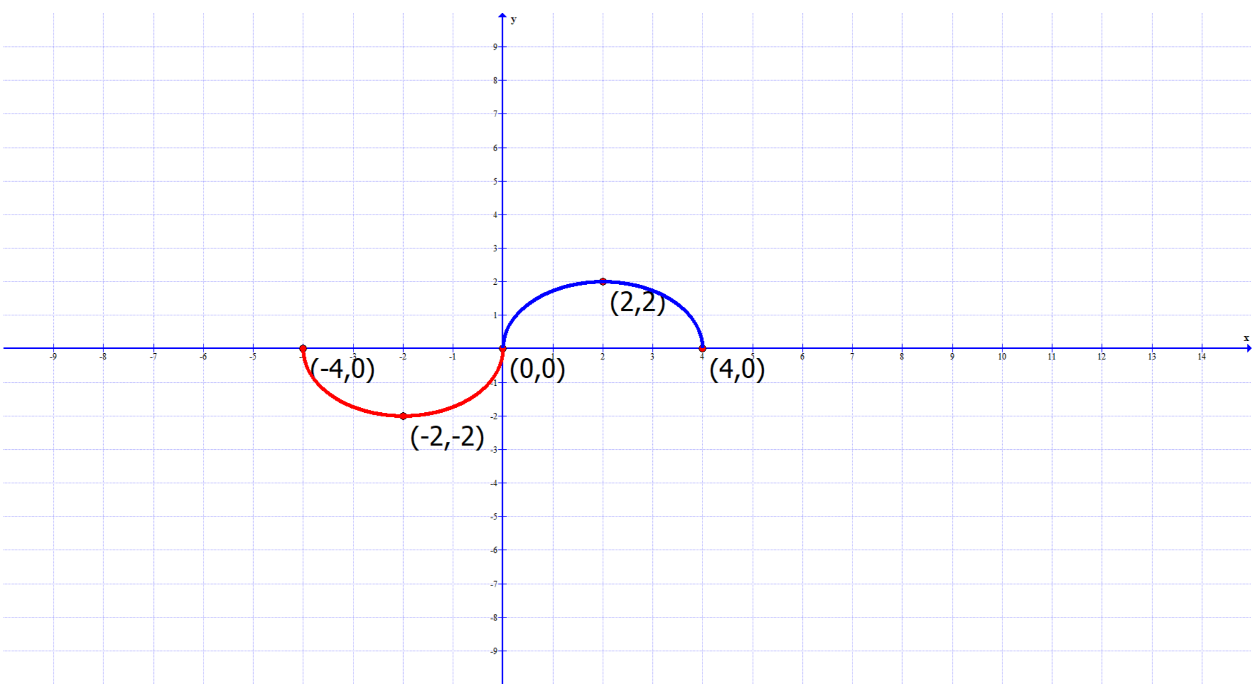
21) Change the sign of the y-coordinate of each point. Plot the new points and connect with the same shape.



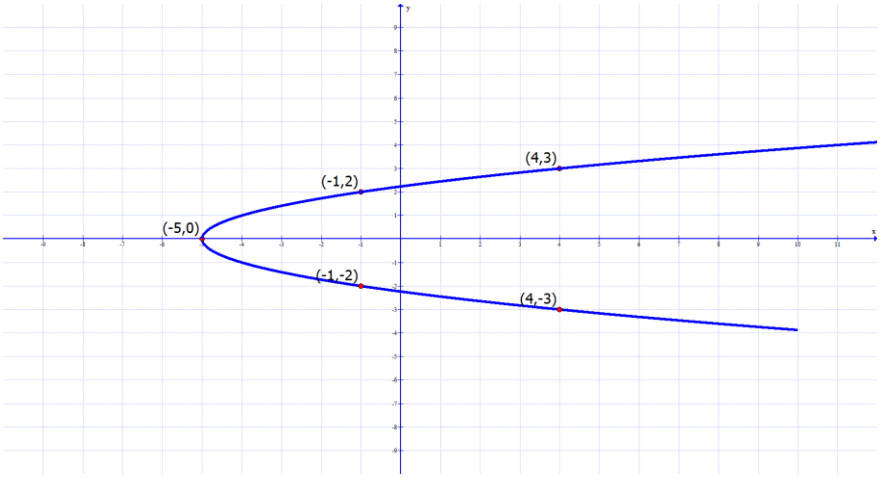
23) Change the sign of the x-coordinate of each point. Plot the new points and connect with the same shape.



25) Change the sign of the x-coordinate and of the y-coordinate of each point. Plot the new points and connect with the same shape.

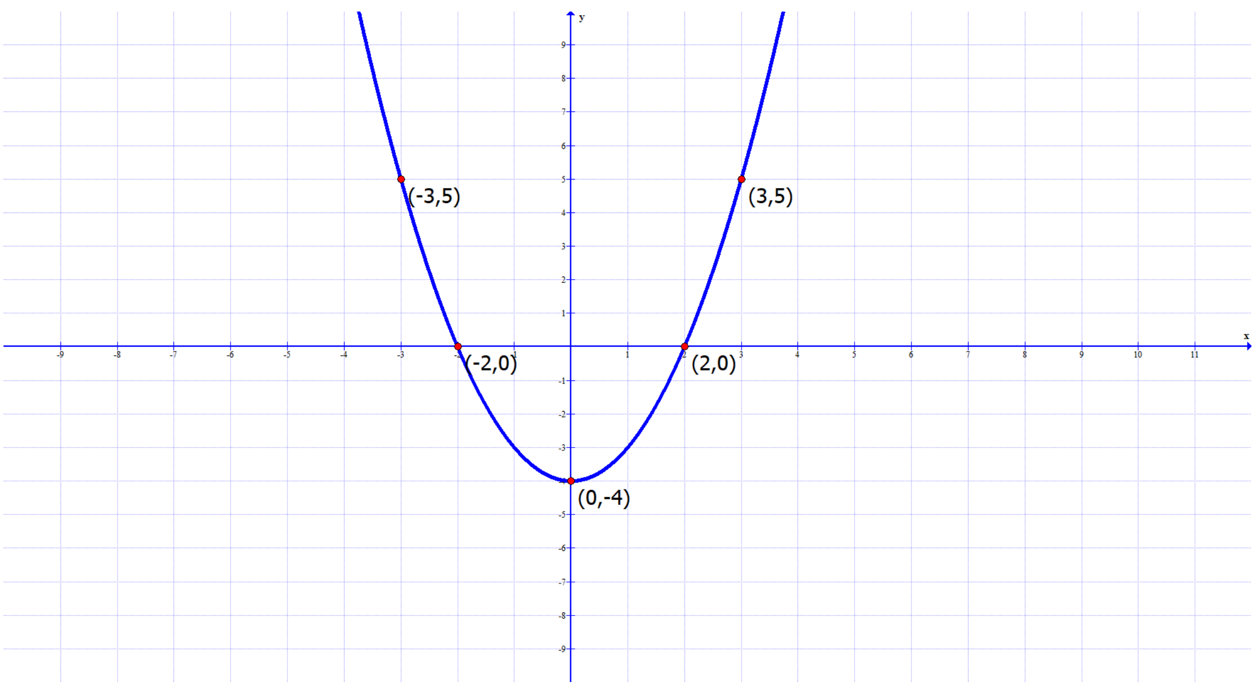


27)



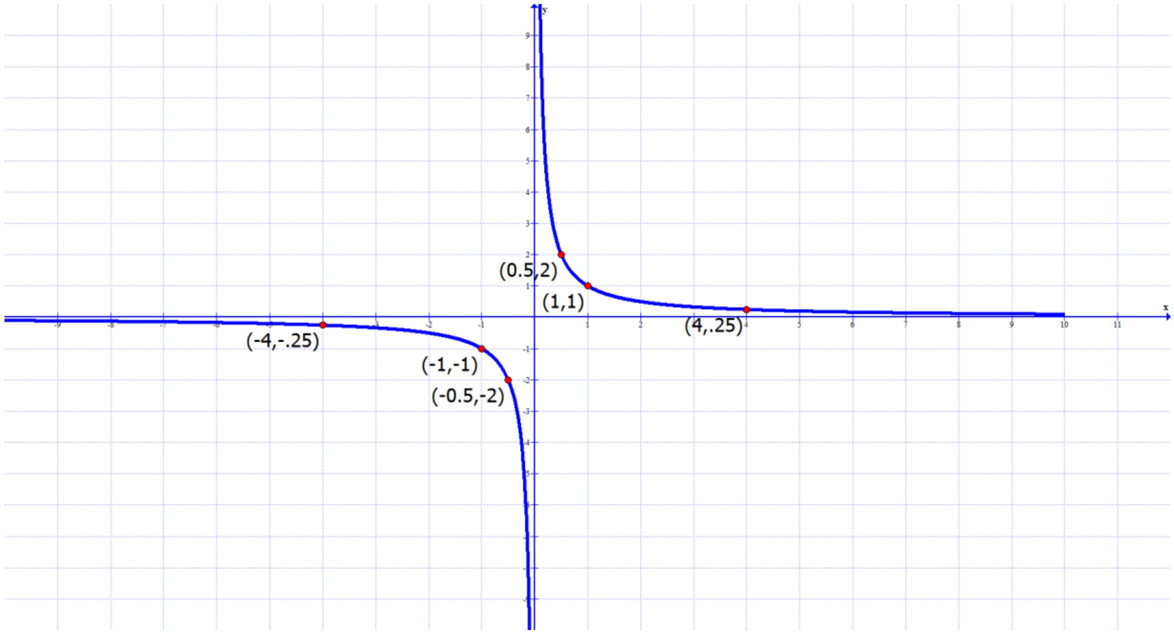
$x - axis$

29)



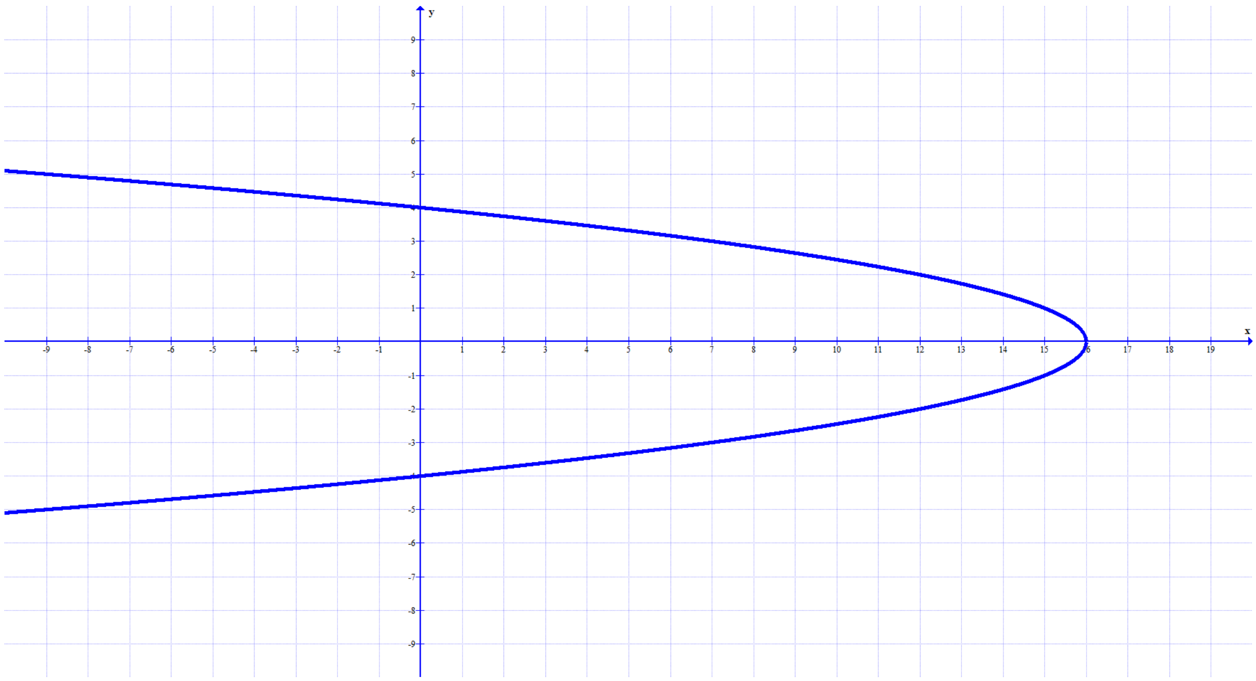
$y - axis$

31) for each point (x, y) on the graph there is a point $(-x, -y)$ hence there is origin symmetry



$origin$

33a) $x - axis\ symmetry$



33b) $replace\ y\ with\ -y, relation\ \ has\ x\ axis\ symmetry\ if\ reduces\ to\ original\ relation$

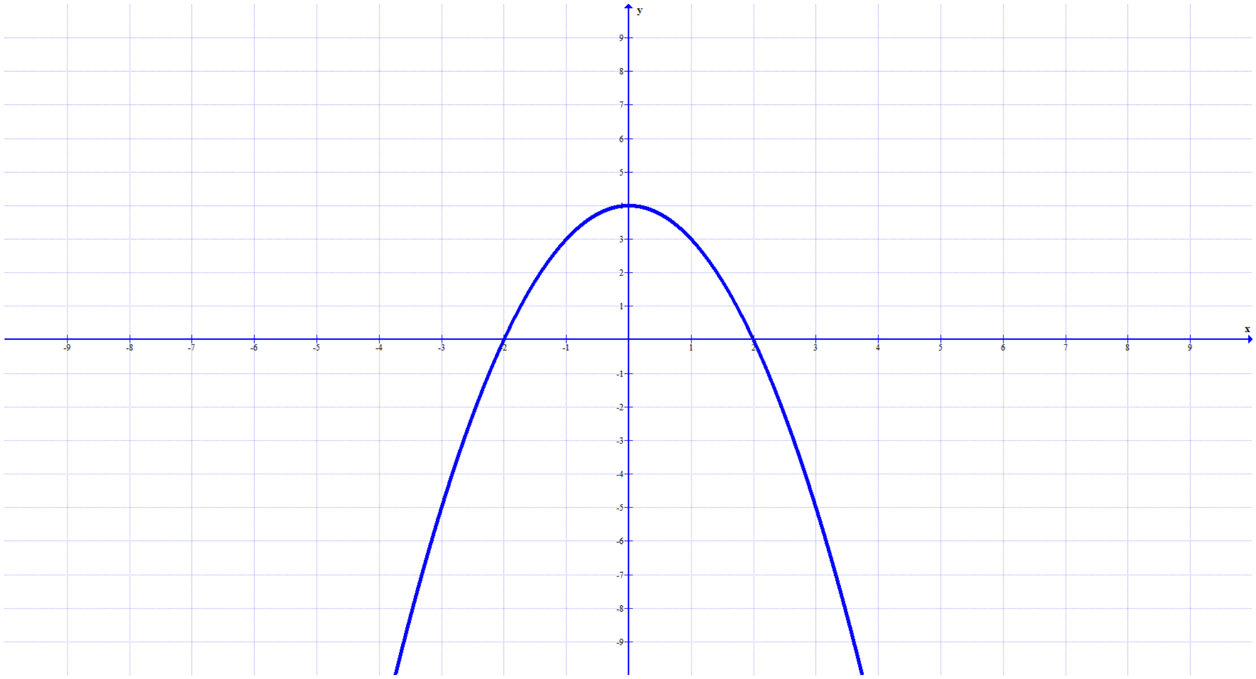
$x + (-y)^2 = 16$

$reduces\ to\!:\ x +\ y^2 = 16$

$since\ (-y)^2 = y^2$

$it\ reduces\ to\ the\ original\ problem\ and\ this\ proves\ x - axis\ symmetry$

35a) $y - axis\ symmetery$



35b) $replace\ x\ with - x,\ relation\ has\ y\ axis\ symmetry\ if\ reduces\ to\ original\ relation$

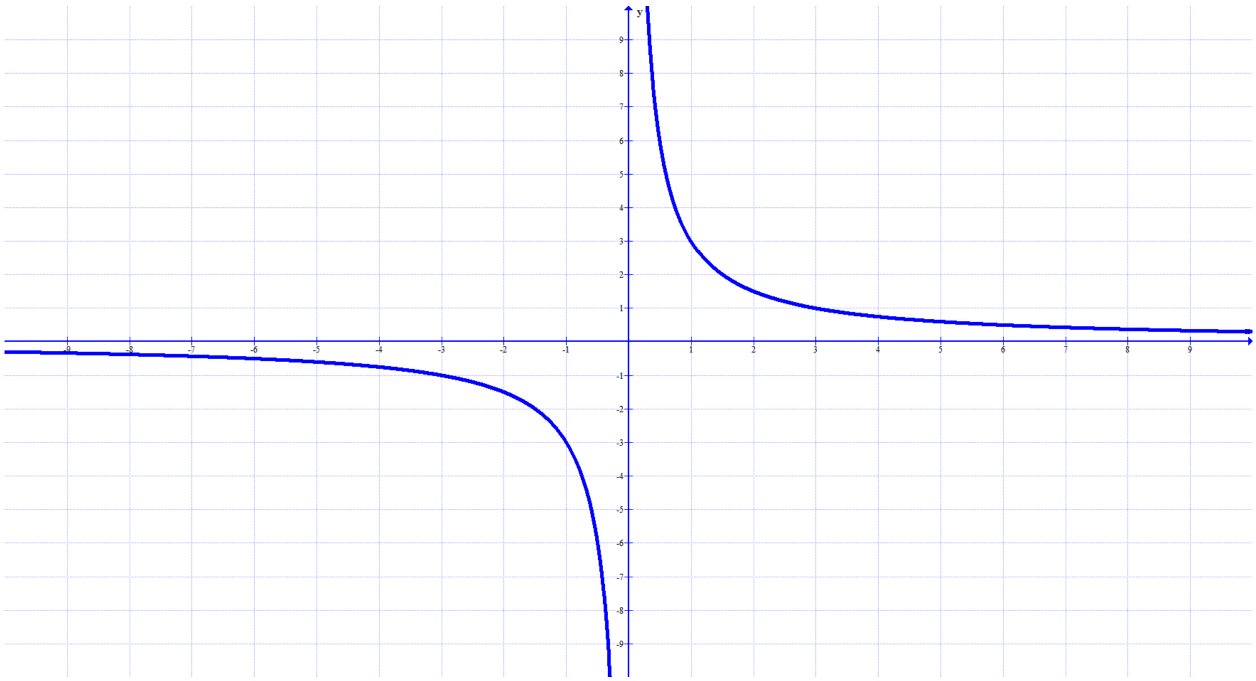
$y + (-x)^2 = 4$

$reduces\ to:\ y + x^2 = 4$

$since\ (-x)^2 = x^2$

$it\ reduces\ to\ the\ original\ problem\ and\ this\ proves\ y - axis\ symmetry$

37a) $origin\ symmetry$



37b) $replace\ x\ with - x\ and\ y\ with - y,$
$relation\ has\ origin\ symmetry\ if\ reduces\ to\ original\ relation$

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

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

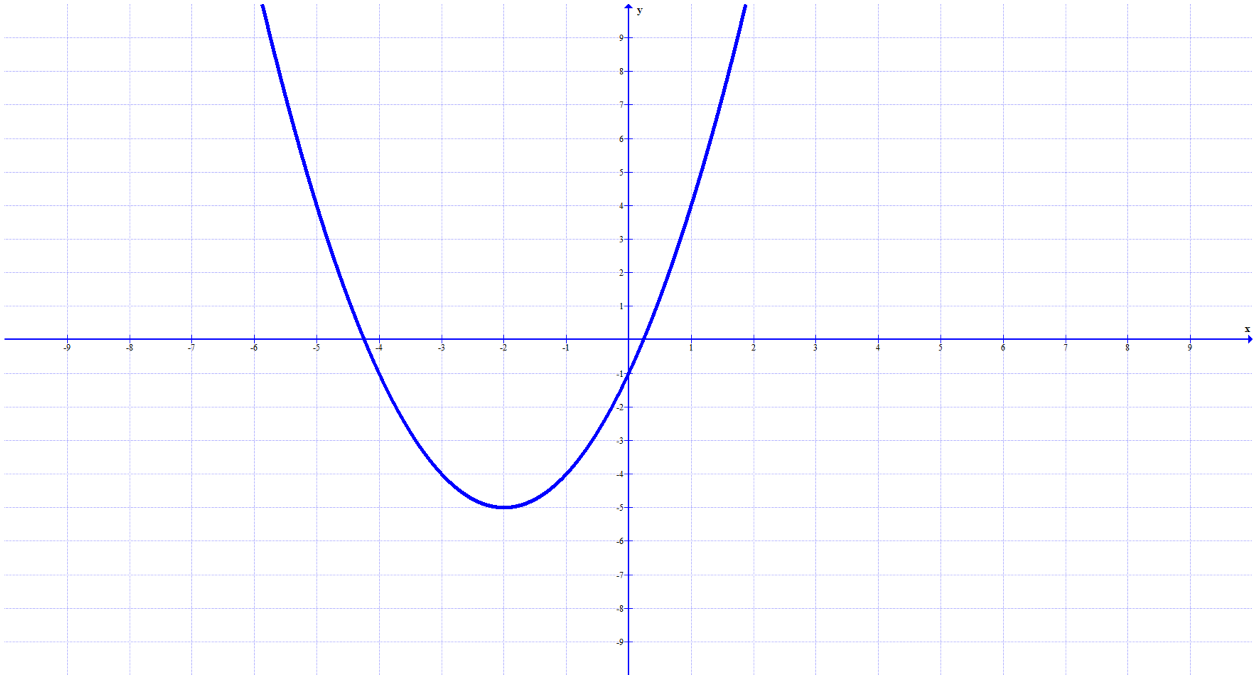
$-1 * (-y) = -1 * \frac{3}{-x}$

$y = \frac{-1}{1} * \frac{3}{-x}$

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

$y = \frac{3}{x}\ \ reduces\ to\ original, proves\ origin\ symmetery$

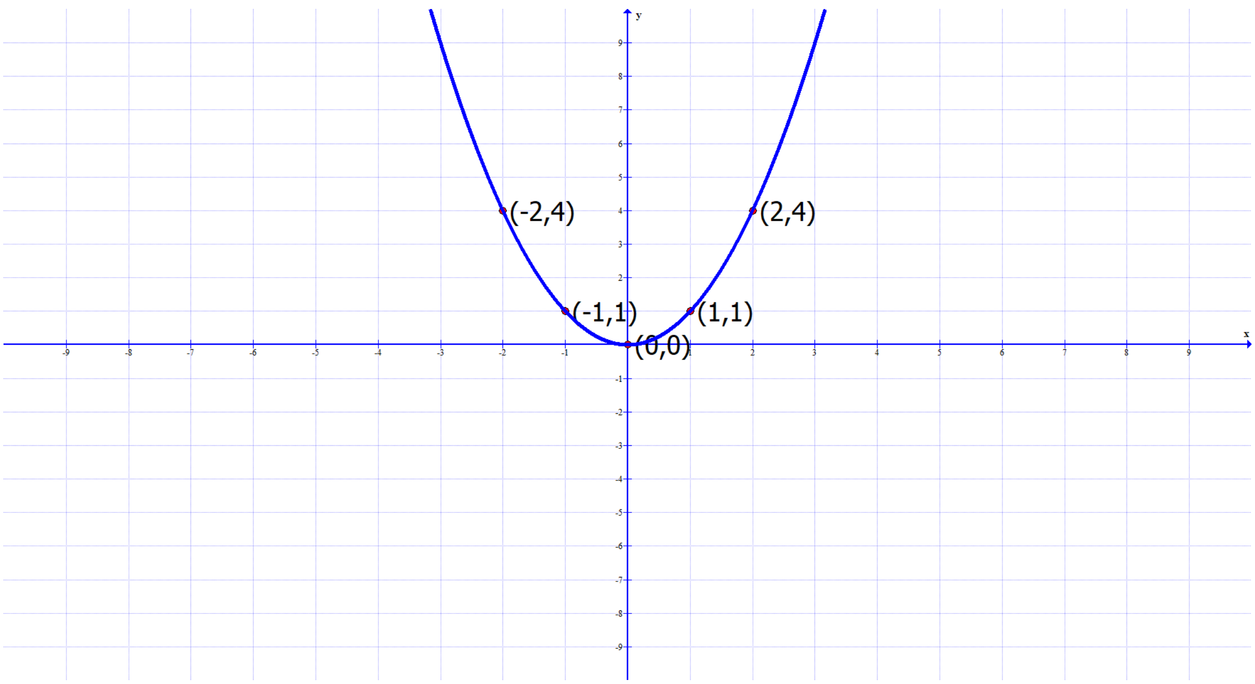
39a) $none \ \ (graph\ has\ none\ of\ the\ 3 - symmetries)$



39b) $no\ test\ to\ be\ done\ as\ relation\ has\ none\ of\ the\ symmetries$

41) $y = x^2$

x	y	Computation of y
-2	4	$y = (-2)^2 = 4$
-1	1	$y = (-1)^2 = 1$
0	0	$y = (0)^2 = 0$
1	1	$y = (1)^2 = 1$
2	4	$y = (2)^2 = 4$



43) $y = \sqrt{x}$

x	y	Computation of y
-2	Not a real number	$y = \sqrt{-2}$ $= \sqrt{2}i$ (*not a real number*)
-1	Not a real number	$y = \sqrt{-1}$ $= i$ (*not a real number*)
0	0	$y = \sqrt{0} = 0$
1	1	$y = \sqrt{1} = 1$
4	2	$y = \sqrt{4} = 2$
9	3	$y = \sqrt{9} = 3$
16	4	$y = \sqrt{16} = 4$