

9.1 Part 2

Friday, May 22, 2020 8:36 AM

9.1 Part 2 Rational Functions Using Transformations

Ex. #1: Using the graph of $y = x^2$. Graph the function $y = \frac{1}{(x-2)^2}$

① $y = x^2$

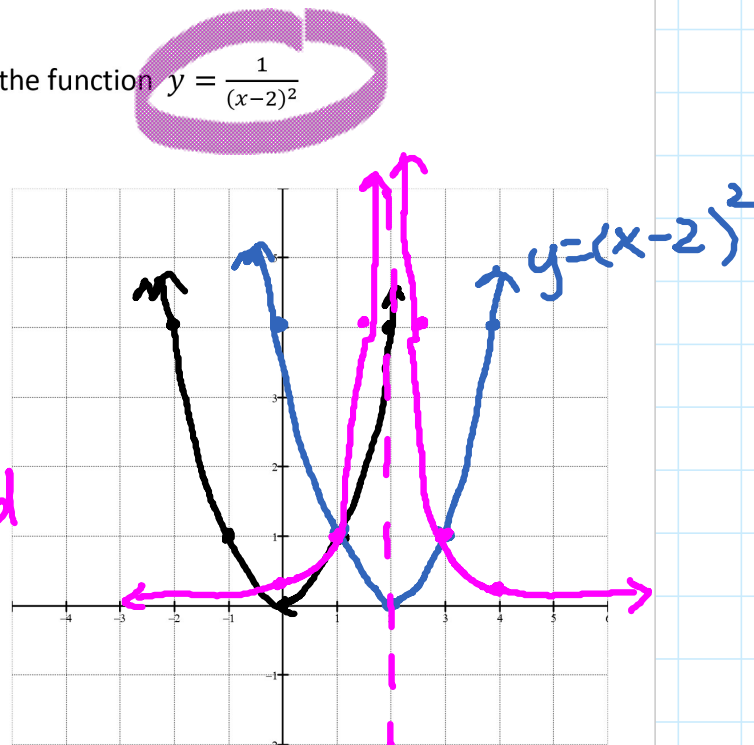
0	0
1	1
2	4
$\frac{1}{2}$	$(\frac{1}{2})^2 = \frac{1}{4}$

② $y = (x-2)^2$

+2	2	0
x's	3	1
	4	4
	2.5	$\frac{1}{4}$

③ $y = \frac{1}{(x-2)^2}$

x	y's
2	yo = undefined
3	y1 = 1
4	1/4
2.5	1/4 = 4



Ex. #2: A rational function is in the form of $y = \frac{a}{x-h} + k$. The function has vertical asymptote at $x = 2$ and a horizontal asymptote at $y = -3$. The graph passes through the point $(5, -1)$. Find the equation of the function.

$x = 2$ vertical asymptote
Horizontal translation right 2
 $h = 2$

$y = -3$ horizontal asymptote
Vertical translation down 3
 $k = -3$

$(5, -1)$
x y

$$y = \frac{6}{x-2} - 3$$

$$y = \frac{a}{x-2} - 3$$

$$-1 = \frac{a}{5-2} - 3$$

$$-1 = \frac{a}{3} - 3$$

$$-3 = a - 9$$

$$6 = a$$

Ex. #3: A rational function $y = \frac{a}{x-2} + k$ passes through the points (3,7) and (-1,3). Find the values of a and k . Graph the function.

(3,7)
x y

(-1,3)

$$7 = \frac{a}{3-2} + k$$

$$3 = \frac{a}{-1-2} + k$$

$$7 = \frac{a}{1} + k$$

$$3 = \frac{a}{-3} + k$$

$$\textcircled{1} 7 = a + k$$

$$\textcircled{2} 9 = -a + 3k$$

①

$$7 = a + k$$

$$9 = -a + 3k$$

$$16 = 4k$$

$$4 = k$$

①

$$7 = a + 4$$

$$3 = a$$

$$y = \frac{3}{x-2} + 4$$

$$y = \frac{1}{x}$$

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

