

NAME: Key

SHOW ALL WORK NEATLY TO RECEIVE CREDIT!

1) Give the coordinates of the image point under a reflection across the given line.

- a. (2, -4); y-axis $(x, y) \rightarrow (-x, y)$
- b. (-5, -8); x-axis $(x, y) \rightarrow (x, -y)$
- c. (-2, 5); y = x $(x, y) \rightarrow (y, x)$
- d. (3, -6); y = -x $(x, y) \rightarrow (y, -x)$

- a. $(-2, -4)$
- b. $(-5, 8)$
- c. $(5, -2)$
- d. $(6, -3)$

x
-2
-1
0

2) Solve by factoring: $3x^2 - 10x + 8 = 0$

$$\begin{array}{r} (x) \\ -10 \overline{) 24} \\ \underline{-60} \\ 24 \end{array}$$

$$3x^2 - 6x - 4x + 8 = 0$$

$$3x(x-2) - 4(x-2) = 0$$

$$(3x-4)(x-2) = 0$$

$$x-2=0 \Rightarrow x=2$$

$$3x-4=0 \Rightarrow 3x=4 \Rightarrow x=4/3$$

$$x = \frac{2}{1} \text{ or } \frac{4}{3}$$

3.) Solve using the Quadratic Formula: $x^2 + 11x = 2$

$$x^2 + 11x - 2 = 0$$

$$x = \frac{-11 \pm \sqrt{11^2 - 4(1)(-2)}}{2(1)}$$

$$x = \frac{-11 \pm \sqrt{129}}{2}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$x = \frac{-11 + \sqrt{129}}{2} \text{ or } \frac{-11 - \sqrt{129}}{2}$$

4.) Solve by taking the square root: $4x^2 + 1 = 25$

$$4x^2 = 24$$

$$x^2 = 6$$

$$x = \sqrt{6} \text{ or } -\sqrt{6}$$

5.) If $\triangle UNC \sim \triangle BAD$, $UC = 15$, $BD = 90$, and $NC = 11$, what is the length of side \overline{AD} ?

$$\frac{15}{90} = \frac{11}{x}$$

$$15x = 990$$

$$x = 66$$

$$AD = 66$$

6.) A racecar completes one lap of the race in 25 seconds travelling 180 miles per hour. If the speed of the car and the time it takes to complete a lap are inversely proportional, how long would it take for the car to complete a lap if it was travelling 200 miles per hour?

Inverse: $y = k/x$

$$25 = \frac{k}{180}$$

$$k = 4500$$

$$y = \frac{4500}{x}$$

$$y = \frac{4500}{200}$$

$$y = 22.5$$

$$22.5 \text{ seconds}$$

5 points

7.) For the transformed quadratic function $y = -(x - 2)^2 + 3$:

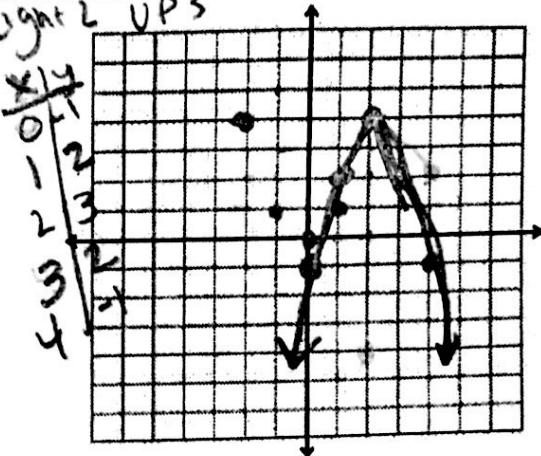
- a.) Give the equation of the parent function.
- b.) List the transformations.
- c.) Show the table of transformed characteristic points.
- d.) Graph the transformed function.

x	y
-2	4
-1	1
0	0
1	1
2	4

reflect

x	y
-2	-4
-1	-1
0	0
1	-1
2	-4

Right 2 UP 3

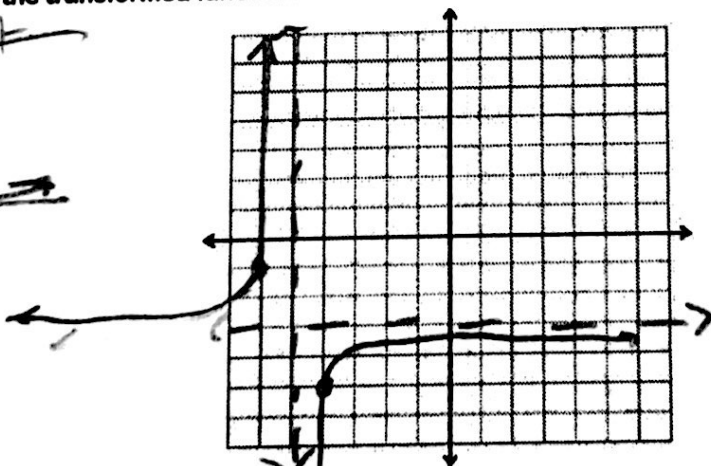
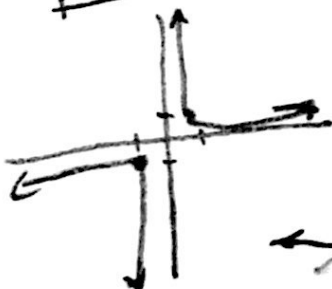


a. $y = x^2$
 b. Reflect (x)
 Right 2
 UP 3

8.) For the transformed rational function $y = -\frac{2}{x+5} - 3$:

- a.) Give the equation of the parent function.
- b.) List the transformations.
- c.) Give the equations of the asymptotes.
- d.) Graph the transformed function.

parent



a. $y = 1/x$
 b. Reflected
 left +5
 down 3
 c. HA: $y = -3$
 VA: $x = -5$

stretch 2

9.) Place the standard form quadratic $y = x^2 - 12x + 7$ in vertex form by completing the square.

ds

$$y = x^2 - 12x + 7$$

$$\downarrow$$

$$\frac{-12}{2} = -6$$

$$(-6)^2 = 36$$

$$y = (x^2 - 12x + 36) + 7 - 36 \leftarrow \text{keep equality}$$

$$y = (x - 6)^2 - 29$$

$$y = (x - 6)^2 - 29$$

Name: Key

Show All Work Neatly To Receive Credit

1) Write the algebraic rule each composition of transformations.

a. Reflect over y-axis; then translate up 4 and left 2.

$$(x, y) \rightarrow (-x, y) \rightarrow (x-2, y+4)$$

b. Rotate 180° about the origin; then dilate by a scale factor of 4.

$$(x, y) \rightarrow (-x, -y) \rightarrow (-4x, -4y)$$

c. Reflect over the line $y = -x$; then rotate -90° about the origin.

$$(x, y) \rightarrow (-y, -x) \rightarrow (-x, y)$$

d. Dilate by a scale factor of 0.4; then translate right 5 down 1.

$$(x, y) \rightarrow (0.4x, 0.4y) \rightarrow (0.4x+5, 0.4y-1)$$

a. $(x, y) \rightarrow (-x-2, y+4)$

b. $(x, y) \rightarrow (-4x, -4y)$

c. $(x, y) \rightarrow (-x, y)$

d. $(x, y) \rightarrow (0.4x+5, 0.4y-1)$

2) Solve using an appropriate method: $2x^2 + 10 = 8x$

$$2x^2 - 8x + 10 = 0$$

$$x = \frac{8 \pm \sqrt{(-8)^2 - 4(2)(10)}}{2(2)} = \frac{8 \pm \sqrt{-16}}{4} = \frac{8 \pm 4i}{4} = 2 \pm i$$

$x = 2+i$ or

$x = 2-i$

3.) Solve: $\sqrt{2x+8} + x = 0$

$$\sqrt{2x+8} = -x$$

$$2x+8 = x^2$$

$$0 = x^2 - 2x - 8$$

$$\begin{array}{r|l} -2 & -8 \\ -4 & -4 \cdot 2 \end{array}$$

$$(x-4)(x+2) = 0$$

$$x-4=0$$

$$x=4$$

$$x+2=0$$

$$x=-2$$

Check answers

$$\sqrt{2(4)+8} + 4 = 0 \quad \times$$

$$\sqrt{2(-2)+8} + (-2) = 0 \quad \checkmark$$

$x = -2$

4.) Solve: $\frac{5}{x+1} = \frac{2}{x-8}$

$$2(x+1) = 5(x-8)$$

$$2x+2 = 5x-40$$

$$42 = 3x$$

$$x = 14$$

$x = 14$

5.) Factor the quadratic $10x^2 - 24x + 8$

$$10x^2 - 24x + 8$$

$$2(5x^2 - 12x + 4)$$

$$\begin{array}{r|l} -12 & 20 \\ -2 & -2 \cdot -10 \end{array}$$

$$2[5x^2 - 10x - 2x + 4]$$

$$2[5x(x-2) - 2(x-2)]$$

$$2[(5x-2)(x-2)]$$

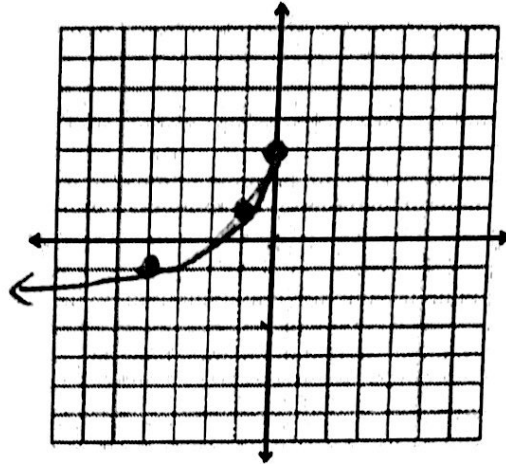
$2(5x-2)(x-2)$

6.) For the transformed radical function $y = -2\sqrt{-x} + 3$:

- Give the equation of the parent function.
- List the transformations.
- Show the table of transformed characteristic points.
- Graph the transformed function.
- Give the domain and range for the transformed function.

+4)
1)
y-1)

x	y
-4	-1
-1	1
0	3



a. $y = \sqrt{x}$
 b. Up 3
Reflect (x & y axis)
Stretch by 2
 e. Dom: $(-\infty, 0]$
 Rng: $(-\infty, 3]$

7.) Recall that a parabola can have up to 2 *x*-intercepts, or roots. The factored form of a quadratic equation gives the roots of a quadratic.

- Come up with two roots, and write your own factored form equation for a parabola with those roots.
- Use box method or double distribution to rewrite your equation in standard form.
- Complete the square to write the standard form equation in vertex form.
- Use the vertex form and the roots from the factored form to graph your parabola.

a. $y = (x + 2)(x - 5)$
 b. $y = x^2 - 3x - 10$
 c. $y = (x - 1.5)^2 - 10.25$

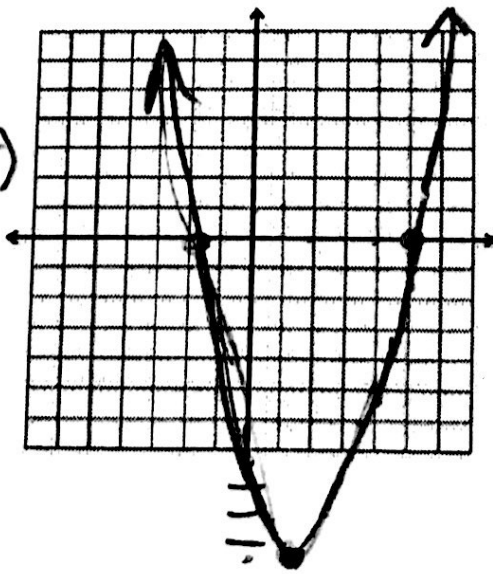
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$x = -2, x = 5$

$y = (x + 2)(x - 5)$

2)

	x	2
x	x^2	$2x$
-5	$-5x$	-10



$y = x^2 - 3x - 10$

$\frac{-3}{2} = -1.5; (-1.5)^2 = 2.25$

vertex:
(1.5, -10.25)

$y = (x^2 - 3x + 2.25) - 10 - 2.25$

$y = (x - 1.5)^2 - 10.25$

$$y = x^2 - 3x + 5$$

$$\frac{-3}{2} = -1.5$$

$$(-1.5)^2 = 2.25$$

$$y = (x - 1.5)^2 + 5 - 2.25$$

$$y = (x - 1.5)^2 + 2.75$$

Vertex Form

$$V: (1.5, 2.75)$$

STEPS

• Divide by b by 2. [Circle Term]

• Square the new term

* Put circled term with (x) ²

inside with x

• Take our constant & subtract new term

• Simplify

FACTOR

5

$$10x^2 - 24x + 8$$

$$2(5x^2 - 12x + 4)$$

$$2[(5x^2 - 10x)(2x + 4)]$$

$$2[5x(x-2) - 2(x-2)]$$

$$2[(x-2)(5x-2)]$$

-12	20
-10 + 2	-10 = 2

Solve:

$$x - 2 = 0 \quad 5x - 2 = 0$$

$$x = 2$$

$$x = 2/5$$

$$5x - 2 = 0$$

$$+2 \quad +2$$

$$\frac{5x}{5} = \frac{2}{5} \quad x = 2/5$$