

Part I: Describe the transformations that each equation underwent assuming the original function is either $y = x^2$ or $y = |x|$.

1) $y = x^2 - 7$

down 7

2) $y = |x - 7|$

right 7

3) $y = (x + 7)^2$

left 7

4) $y = |x| + 7$

up 7

4) $y = (x + 6)^2 - 11$

left 6
down 11

5) $y = |x - 3| - 7$

right 3
down 7

6) $y = |x + 3| + 13$

left 3
up 13

Part II: Write an equation for each graph described below.

1) Shift the graph of $y = x^2$ right 3 units

$$y = (x - 3)^2$$

2) Shift the graph of $y = x^2$ down 5 units

$$y = x^2 - 5$$

3) Shift the graph of $y = |x|$ left 9 units

$$y = |x + 9|$$

4) Shift the graph of $y = |x|$ up 10 units

$$y = |x| + 10$$

5) Shift the graph of $y = |x|$ up 12 and right 4

$$y = |x - 4| + 12$$

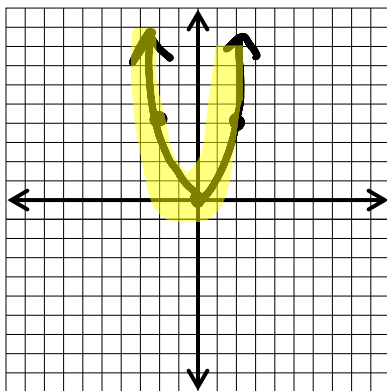
6) Shift the graph of $y = x^2$ down 2 and left 8

$$y = (x + 8)^2 - 2$$

Part III: Given is a graph of $y = x^2$ or $y = |x|$. Also given is a list of points that lies on the original graph. For each *transformed* equation, do the following:

a) List the transformations (i.e. left 5, up 2, etc)

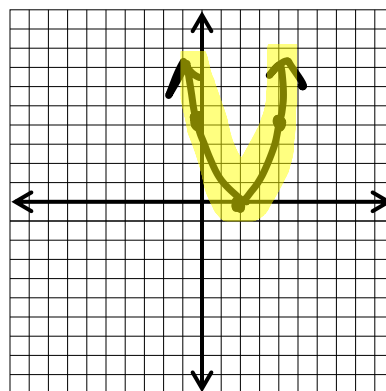
b) Draw the graph of the new function – plot specific points based on the transformations from part a. An example below has been done for you. ****If you shift up/down, change the y-values; If you shift left/right, change the x-values!**



Original: $y = x^2$

| x | y |
|----|---|
| 0 | 0 |
| 2 | 4 |
| -2 | 4 |

↑
add 2



Transformed

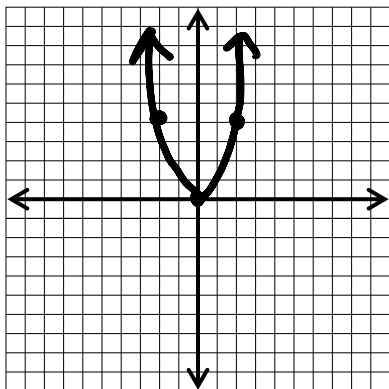
Equation:

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

* Right 2
* Add 2 to the x's to make it go right!

| x | y |
|---|---|
| 2 | 0 |
| 4 | 4 |
| 0 | 4 |

1)

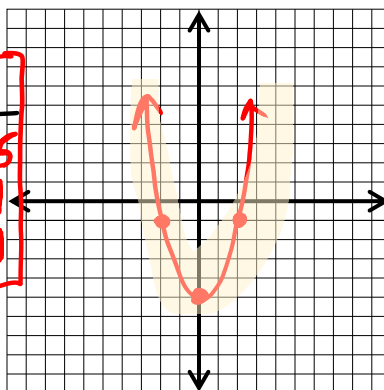


Original: $y = x^2$

| x | y |
|----|---|
| 0 | 0 |
| 2 | 4 |
| -2 | 4 |

| x | y |
|----|----|
| 0 | -5 |
| 2 | -1 |
| -2 | -1 |

↑
subtract
5

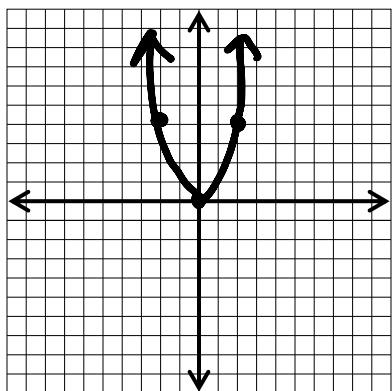


Transformed Equation:

$y = x^2 - 5$

↑
* down 5
* subtract 5 from y

2)

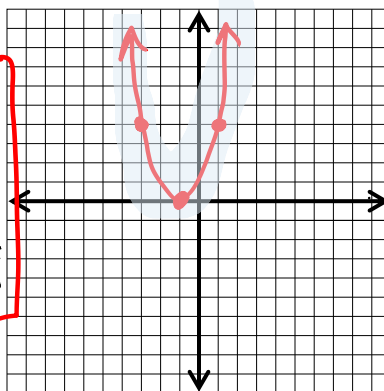


Original: $y = x^2$

| x | y |
|----|---|
| 0 | 0 |
| 2 | 4 |
| -2 | 4 |

| x | y |
|----|---|
| -1 | 0 |
| 1 | 4 |
| -3 | 4 |

↑
subtract
1

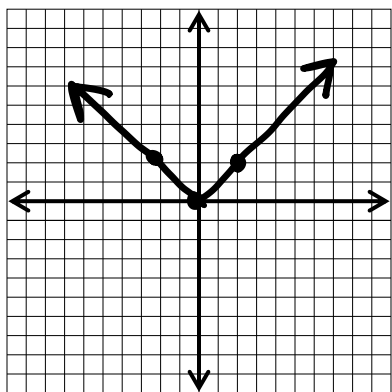


Transformed Equation:

$y = (x+1)^2$

↑
* left 1
* subtract 1 from x

3)

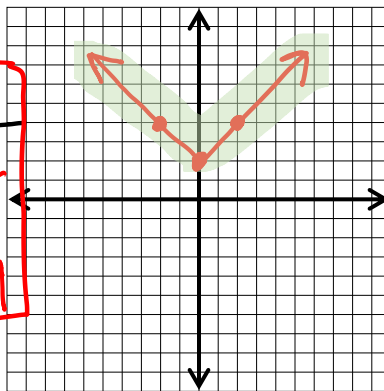


Original: $y = |x|$

| x | y |
|----|---|
| 0 | 0 |
| 2 | 2 |
| -2 | 2 |

| x | y |
|----|---|
| 0 | 2 |
| 2 | 4 |
| -2 | 4 |

↑
add
2

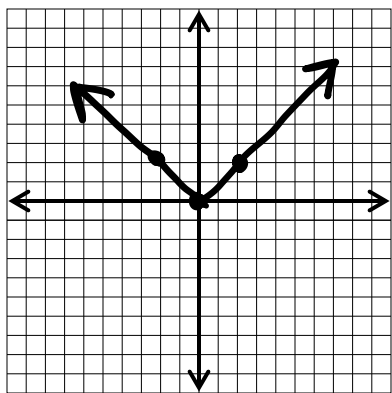


Transformed Equation:

$y = |x| + 2$

↑
* up 2
* add 2 to y

4)

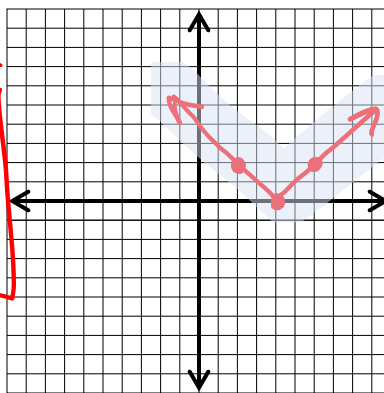


Original: $y = |x|$

| x | y |
|----|---|
| 0 | 0 |
| 2 | 2 |
| -2 | 2 |

| x | y |
|---|---|
| 4 | 0 |
| 6 | 2 |
| 2 | 2 |

↑
add
4



Transformed Equation:

$y = |x-4|$

* right 4
* add 4 to x