

TRANSFORMATIONS - SHIFTS

1) On your calculator, graph the equation: $y = x^2$



2) Then graph the following equations. After each individual equation, explain what happened to the new graph compared to the original graph. (i.e. the graph moved up 5 units, etc.)

a) $y = x^2 + 3$

up 3

b) $y = x^2 + 8$

up 8

c) $y = x^2 - 2$

down 2

d) $y = x^2 - 6$

down 6

3) What equation would we need if we wanted to have the original graph, $y = x^2$ do the following:

a) Shift up 2 units

$y = x^2 + 2$

b) Shift down $\frac{1}{2}$ unit

$y = x^2 - \frac{1}{2}$

c) Shift up 7 units

$y = x^2 + 7$

4) Now clear out all your graphs except for the equation: $y = x^2$.

5) Then graph the following equations. After each individual equation, explain what happened to the new graph compared to the original graph. (i.e. the graph moved up 5 units, etc.)

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

right 3

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

right 6

c) $y = (x+2)^2$

left 2

d) $y = (x+5)^2$

left 5

6) What equation would we need if we wanted to have the original graph, $y = x^2$ do the following:

a) shift right 4 units

$y = (x-4)^2$

b) shift left 7 units

$y = (x+7)^2$

c) shift right $\frac{3}{4}$ units

$y = (x - \frac{3}{4})^2$

7) Using what you learned in the previous questions, what shifts do you think the graph of $y = (x-1)^2 + 4$ underwent?

right 1, up 4

Graph it and check your answer!

8) What are the coordinates of the vertex of the parabola in #7?

(1, 4)

9) What shifts did the graph of $y = (x+2)^2 - 8$ undergo?

left 2, down 8

Graph it and check your answer!

10) What are the coordinates of the vertex in #9?

(-2, -8)

Now do it with absolute value graphs!

1) On your calculator, graph the equation: $y = |x|$



2) Then graph the following equations. After each individual equation, explain what happened to the new graph compared to the original graph. (i.e. the graph moved up 5 units, etc.)

a) $y = |x| + 3$

up 3

b) $y = |x| + 8$

up 8

c) $y = |x| - 2$

down 2

d) $y = |x| - 6$

down 6

3) What equation would we need if we wanted to have the original graph, $y = |x|$ do the following:

a) Shift up 2 units

$$y = |x| + 2$$

b) Shift down $\frac{1}{2}$ unit

$$y = |x| - \frac{1}{2}$$

c) Shift up 7 units

$$y = |x| + 7$$

4) Now clear out all your graphs except for the equation: $y = |x|$.

5) Then graph the following equations. After each individual equation, explain what happened to the new graph compared to the original graph. (i.e. the graph moved up 5 units, etc.)

a) $y = |x - 3|$

right 3

b) $y = |x - 6|$

right 6

c) $y = |x + 2|$

left 2

d) $y = |x + 5|$

left 5

6) What equation would we need if we wanted to have the original graph, $y = |x|$ do the following:

a) shift right 4 units

$$y = |x - 4|$$

b) shift left 7 units

$$y = |x + 7|$$

c) shift right $\frac{3}{4}$ units

$$y = |x - \frac{3}{4}|$$

7) Using what you learned in the previous questions, what shifts do you think the graph of $y = |x - 1| + 4$ underwent?

right 1, up 4

Graph it and check your answer!

8) What shifts did the graph of $y = |x + 2| - 8$ undergo?

left 2, down 8

Graph it and check your answer!