

Learning Target: to identify 6 parent functions, name transformations, and graph

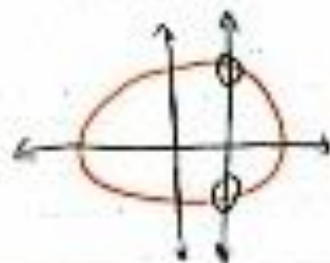
Name _____ Date _____ Per _____

Transformations of Functions Graphic Organizer

Relations (non-functions)

Repeating x-values or graph does not pass vertical line test

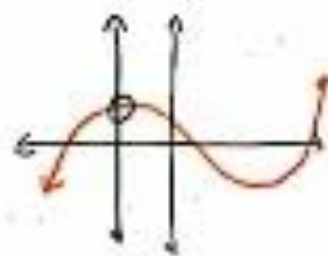
| x | y |
|---|----|
| 3 | 0 |
| 4 | 7 |
| 5 | 10 |
| 6 | 14 |



Functions

Non-repeating x-values and passes vertical line test

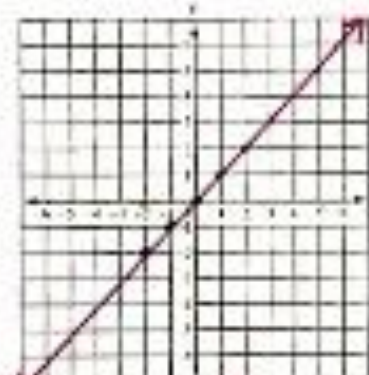
| x | y |
|----|---|
| -1 | 5 |
| 0 | 3 |
| 1 | 4 |
| 2 | 7 |



$$y = x$$

Linear Function

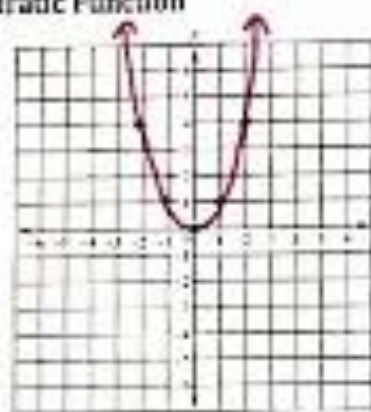
| x | y |
|----|----|
| -2 | -2 |
| -1 | -1 |
| 0 | 0 |
| 1 | 1 |
| 2 | 2 |



$$y = x^2$$

Quadratic Function

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



$$y = x^3$$

Cubic Function

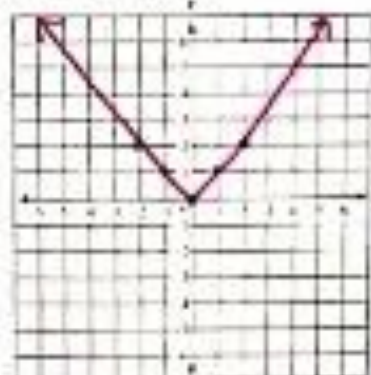
| x | y |
|----|----|
| -2 | -8 |
| -1 | -1 |
| 0 | 0 |
| 1 | 1 |
| 2 | 8 |



$$y = |x|$$

Absolute Value Function

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

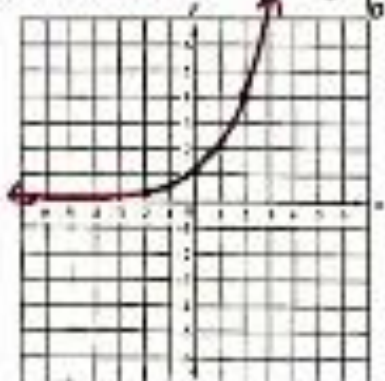


$$y = 2^x$$

Exponential Function

$$y = b^x \quad b > 1$$

| x | y |
|----|-----|
| -2 | 1/4 |
| -1 | 1/2 |
| 0 | 1 |
| 1 | 2 |
| 2 | 4 |

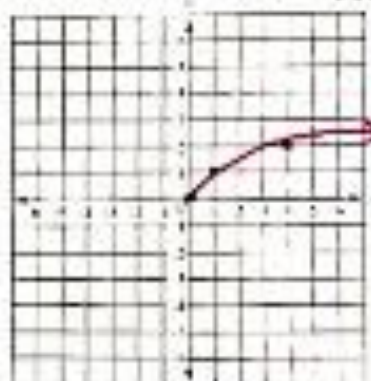


$$y = \sqrt{x}$$

Square Root Function

$$\sqrt{-2} = i\sqrt{2}$$

| x | y |
|----|-------------|
| -2 | \emptyset |
| -1 | \emptyset |
| 0 | 0 |
| 1 | 1 |
| 4 | 2 |



$$2^2 \rightarrow 2^{-2}$$

Transformations of Functions Graphic Organizer

Types of Function Transformations

| | | |
|--|---|--|
| horizontal translation (right) $f(x-h)$ | horizontal translation (left) $f(x+h)$ | vertical translation (up) $f(x)+k$ |
| vertical translation (down) $f(x)-k$ | horizontal reflection (x-axis) (upside down) $-f(x)$ | vertical reflection (y-axis) $f(-x)$ |
| vertical stretch $a > 1$ (Narrow) $af(x)$ | vertical shrink or compression $0 < a < 1$ (wide) $af(x)$ | |

All together with examples

- a.) Name the parent function and all the transformations:
- $f(x) = 2(x-3)^2 + 4$

Quadratic

vertical stretch, horizontal translation (R), vertical translation (up)

- b.) Name the parent function and all of the transformations:
- $f(x) = -\frac{1}{2}(x+4)^3 - 3$

Cubic

horizontal reflection, vertical shrink, horizontal translation (L)

vertical translation down.

- c.) Name the parent function and all of the transformations:
- $f(x) = -|x+1| - 3$

Absolute value

horizontal reflection, horizontal translation (L) vertical translation (down)

- d.) Name the parent function and all of the transformations:
- $f(x) = \sqrt{-x+3} - 4$

Square root

vertical reflection, horizontal translation right, vertical translation down

- e.) Name the parent function and all of the transformations:
- $f(x) = 2(x+7) - 4$

linear

vertical stretch, horizontal translation (L) vertical translation down

- f.) Name the parent function and all of the transformations:
- $f(x) = -2(3)^{x+5} + 8$

Exponential

horizontal reflection, horizontal translation (L), vertical translation up