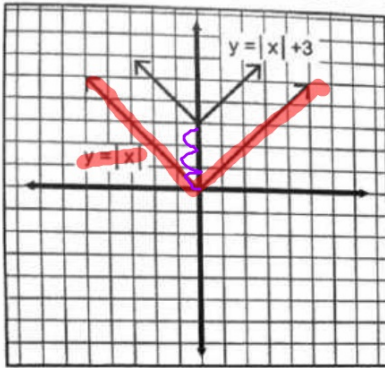


stretch or compression

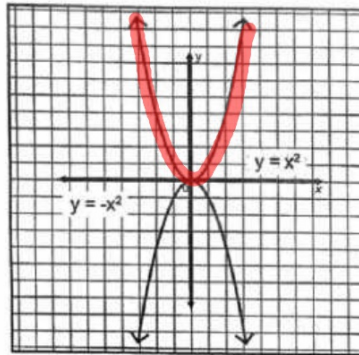
TRANSLATION



Describe this transformation:

- Translations move the parent function up, down, left, right
- $y = |x| + 3$: up 3
- $y = |x| - 3$: down 3
- $y = |x + 3|$: left 3
- $y = |x - 3|$: right 3

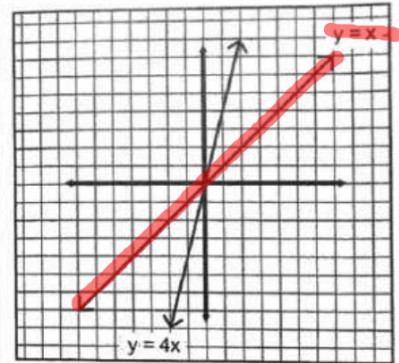
REFLECTION



Describe this transformation:

- Reflections flip the parent function.
- $y = -x^2$ reflects over x-axis
- $y = (-x)^2$ reflect over y-axis

DILATION

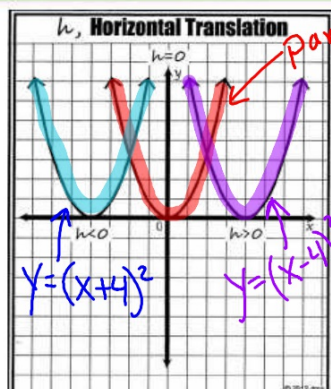


Describe this transformation:

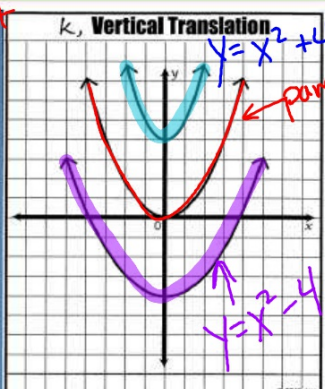
- Dilations appear to change the size of the graph.
- $y = 4x$ $y = -4x$ Stretch
- $y = \frac{1}{4}x$ $y = -\frac{1}{4}x$ Compression

$f(x)$ Parent function

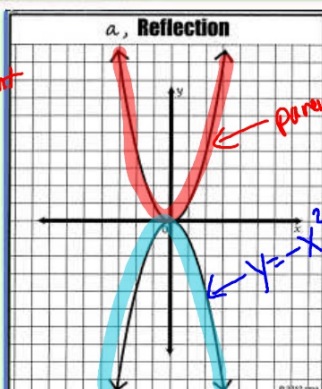
Function Transformations Notes



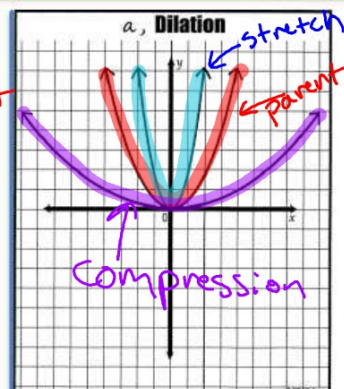
- $y = f(x+h)$
move left h units
- $y = f(x-h)$
move right h units



- $y = f(x) + k$
up k units
- $y = f(x) - k$
down k units



- $y = -f(x)$
reflect over x -axis
- $y = f(-x)$
reflect over y -axis



- $y = a \cdot f(x)$
- if $|a| > 1$
then a stretch
- if $0 < |a| < 1$
then a compression