

Parent Function Transformations

Algebra 2 - Unit 2

I can...

- Identify the mathematical domains and ranges of transformed functions from various representations (graph, table, algebraic).
- Determine reasonable domain and range values for continuous and discrete situations.
- Identify graphs and equations of parent functions (linear, quadratic, exponential, absolute value, square root and rational).
- Sketch graphs of transformed functions (linear, quadratic, exponential, absolute value, square root and rational).

Linear

Parent Function: $f(x) = x$

Transformation Function: $f(x) = mx + b$

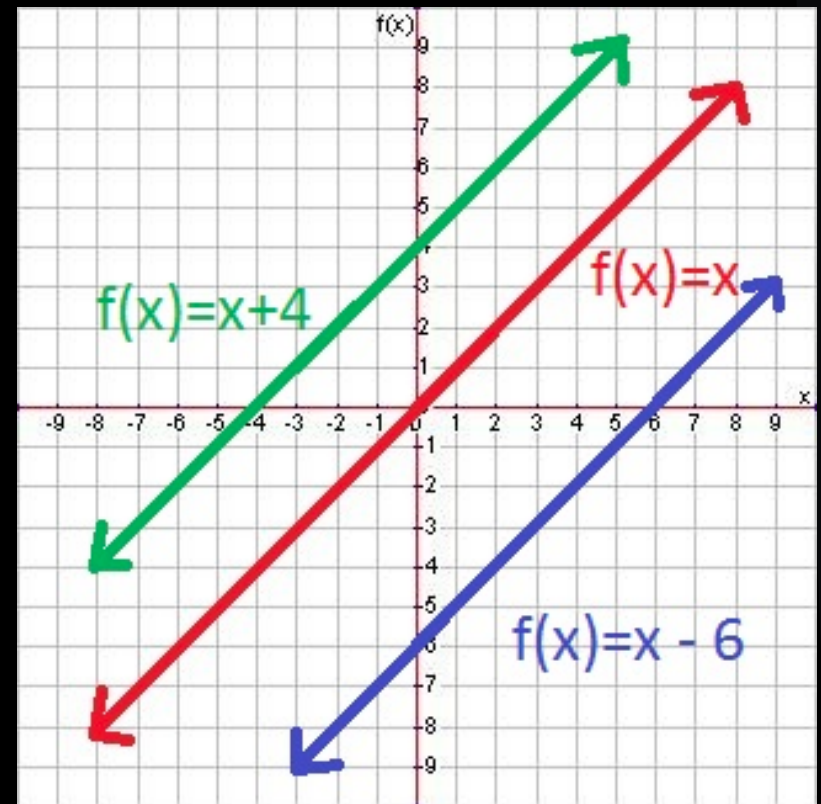
Translations:

$$f(x) = x + 4$$

vertical translation up 4

$$f(x) = x - 6$$

vertical translation down 6



Quadratic

Parent Function: $f(x) = x^2$

Transformation Function: $f(x) = a(x-h)^2 + k$

Translations:

$h > 0$translates horizontally right “h” units

$h < 0$translates horizontally left “h” units

$k > 0$translates vertically up “h” units

$k < 0$translates vertically down “h” units

Square Root

Parent Function: $f(x) = \sqrt{x}$

Transformation Function: $f(x) = a\sqrt{(x-h)^2} + k$

Translations:

$h > 0$translates horizontally right “h” units

$h < 0$translates horizontally left “h” units

$k > 0$translates vertically up “h” units

$k < 0$translates vertically down “h” units

Absolute Value

Parent Function: $f(x) = |x|$

Transformation Function: $f(x) = a|x-h|^2 + k$

Translations:

$h > 0$translates horizontally right “h” units

$h < 0$translates horizontally left “h” units

$k > 0$translates vertically up “h” units

$k < 0$translates vertically down “h” units

Cubic

Parent Function: $f(x) = x^3$

Transformation Function: $f(x) = a(x-h)^3 + k$

Translations:

$h > 0$translates horizontally right “h” units

$h < 0$translates horizontally left “h” units

$k > 0$translates vertically up “h” units

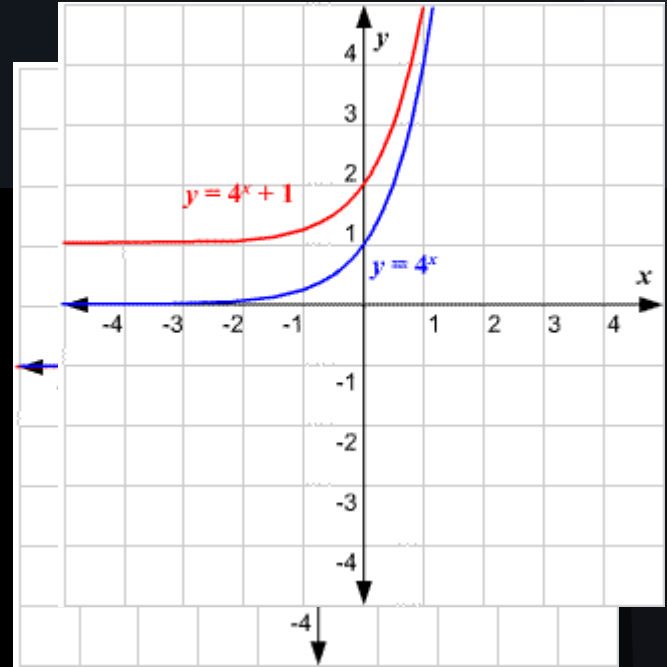
$k < 0$translates vertically down “h” units

Exponential

Parent Function: $f(x) = b^x$

Transformation Function:

$$f(x) = a^{(x-h)} + k$$



Translations:

$h > 0$translates horizontally right “h” units

$h < 0$translates horizontally left “h” units

$k > 0$translates vertically up “h” units

$k < 0$translates vertically down “h” units

Rational

Parent Function: $f(x) = \frac{1}{x}$

Transformation Function: $f(x) = \frac{a}{x - h} + k$

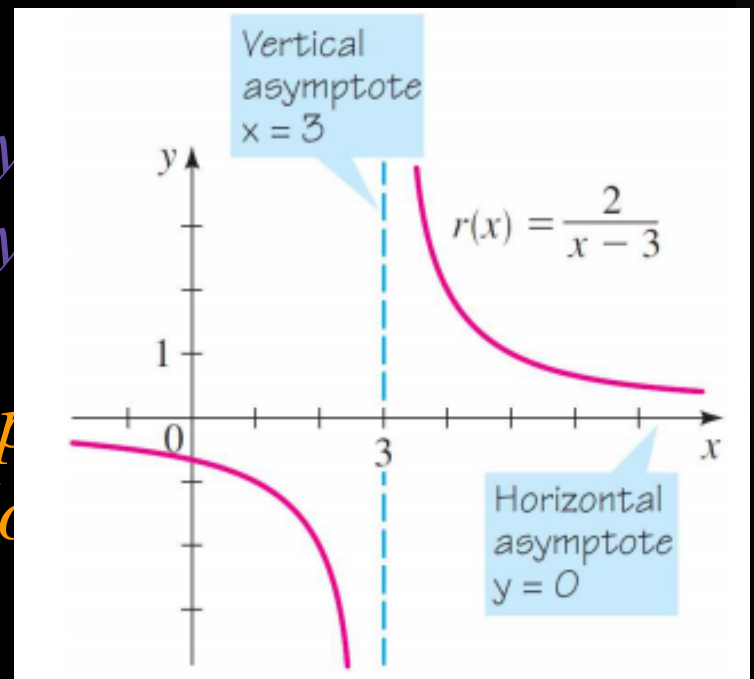
Translations:

$h > 0$translates horizontally

$h < 0$translates horizontally

$k > 0$translates vertically up

$k < 0$translates vertically down



Coming Up...

- Compress/Stretch
- Reflection