Function Translations

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Function Translation Rules

Transformation Rules

The following table summarizes the rules for vertical translation of a function $y = f(x)$.

Table 1: Translation Rules

Function	Vertical Translation	Result	Point
$y = f(x)$	**Upward** by k units	$y = f(x) + k$	$(x, y + k)$
$y = f(x)$	**Downward** by k units	$y = f(x) - k$	$(x, y - k)$
$y = f(x)$	**Right** by h units	$y = f(x - h)$	$(x - h, y)$
$y = f(x)$	**Left** by h units	$y = f(x + h)$	$(x + h, y)$
$y = f(x)$	**Stretch** by h units	$y = f(x - h)$	$(x - h, y)$
$y = f(x)$	**LeSft** by h units	$y = f(x + h)$	$(x + h, y)$

Parent Translation

The following table summarizes the rules for horizontal translation of a function $y = f(x)$.

Table 2: Translating $f(x) = x^2$

Function	Vertical Translation	Result	Point
$y = x^2$	**Upward** by k units	$y = x^2 + k$	$(x, y + k)$
$y = x^2$	**Downward** by k units	$y = x^2 - k$	$(x, y - k)$
$y = x^2$	**Right** by h units	$y = (x - h)^2$	$(x - h, y)$
$y = x^2$	**Left** by h units	$y = (x + h)^2$	$(x + h, y)$

Quadratic Function Transformations

Function	**Vertical Translation**	**Resulting Equation**	**Transformed Point**
$y = x^2$	Upward by k units	$y = x^2 + k$	$(x, y + k)$
$y = x^2$	Downward by k units	$y = x^2 - k$	$(x, y - k)$

Quadratic Function Transformations

Convert each of the following Transformations from function notation to words

$y = \frac{1}{2}f(x-1)+2$	$y = 5f(-x)+3$	$y = -2f(x+1)-2$	$y = f(x-3)+4$