

2.7 Transformations

Obj: 1. Identify the transformations from one graph to another.

Transformation: an alteration in the equation function rule that results in an alteration in the graph.

$$y = x$$

$$y = \underline{2}x + \underline{3}$$

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Translations: Shift

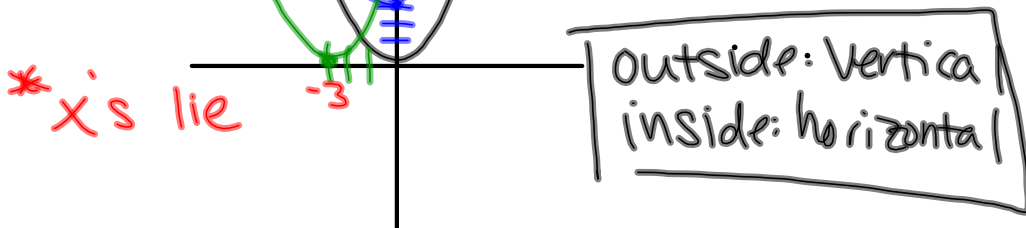
vertical: up/down

horizontal: left/right

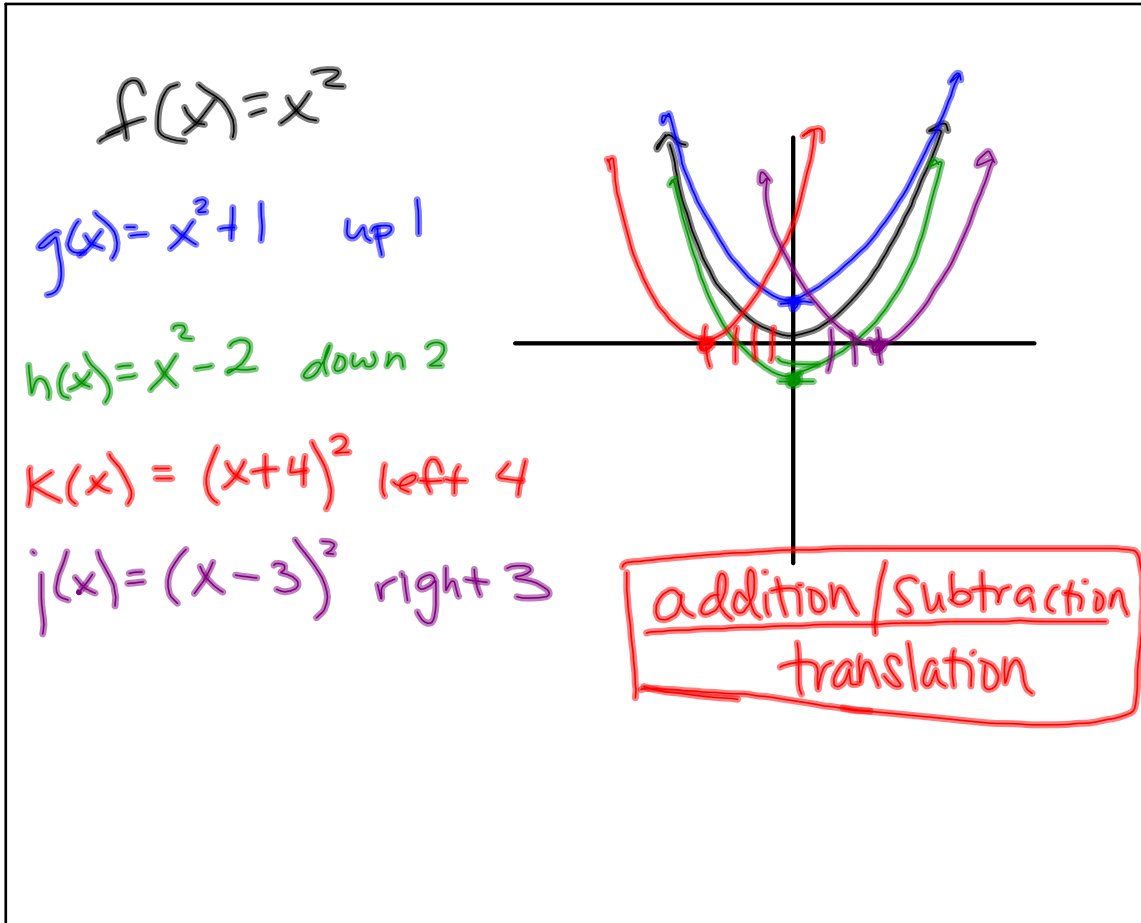
$$f(x) = x^2$$

$$g(x) = x^2 + 3 \quad \text{outside}$$

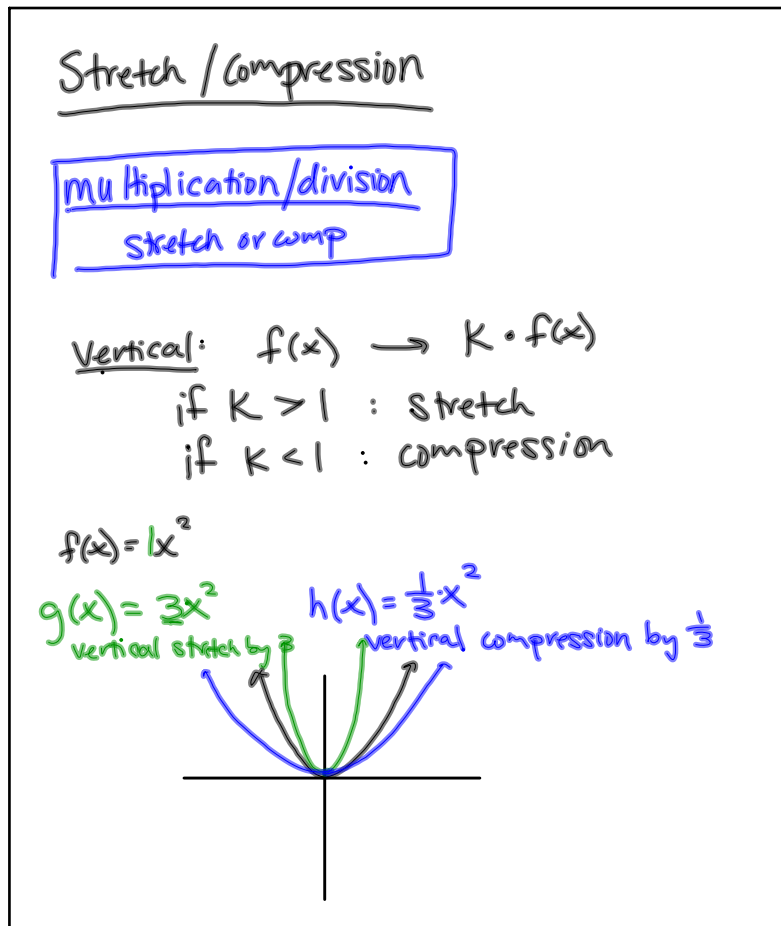
$$h(x) = (x+3)^2 \quad \text{inside}$$



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Horizontal: $f(x) \rightarrow f(kx)$

if $k > 1$: compression by $\frac{1}{k}$

if $k < 1$: stretch by $\frac{1}{k}$

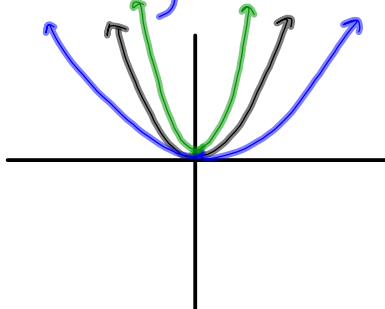
$f(x) = x^2$

$g(x) = (\frac{1}{2}x)^2$

horiz. stretch by 2

$h(x) = (4x)^2$

horiz. comp. by $\frac{1}{4}$



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Reflections

Negative Reflection

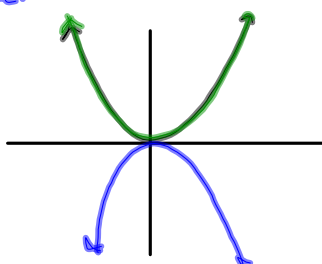
outside: refl. over x-axis

inside: refl. over y-axis

$f(x) = x^2$

$g(x) = -x^2$
refl. over x-axis

$h(x) = (-x)^2$
refl. over y-axis



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$$f(x) = x^2$$

$$g(x) = 2x^2 \text{ vertical str. by } 2$$

$$h(x) = (2x)^2 \text{ horiz. comp by } \frac{1}{2}$$

$$j(x) = -(x+2)^2 - 6$$

refl. over x-axis
left 2
down 6

$$k(x) = (-x)^2 + 1$$

refl. over y-axis
up 1

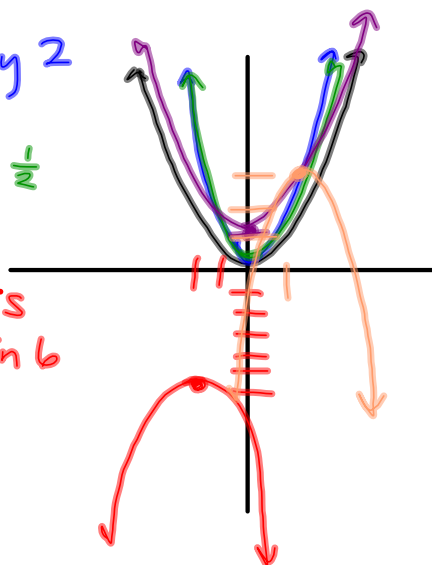
$$m(x) = -2(x-1)^2 + 3$$

refl. over x-axis

V. Str. by 2

right 1

up 3



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