$y = f(x)$

Horizontal and Vertical Stretch/Shrink

$y = f(c \cdot x)$

Shrink by $\frac{1}{c}$ $c > 1$

Stretch by $\frac{1}{c}$ $\frac{1}{1/2} = 1 \cdot 2$

$0 < c < 1$

$y = c \cdot f(x)$

stretch $c > 1$

shrink $0 < c < 1$

Describe:

a) $g(x) = 5 \cdot \sin x$

V stretch 5

b) $h(x) = \sin\left(\frac{1}{2}x\right)$ $c = \frac{1}{2}$

$\sin(c \cdot x)$

H stretch by 2

Ex Start w/ $y = x^2$

a) horiz. shift 2 right $y = (x-2)^2$

b) vertical stretch 3 $y = 3(x-2)^2$

c) vertical shift 5 up $y = 3(x-2)^2 + 5$

take this ↗ and write in standard form

$y = 3x^2 - 12x + 17$

Reverse order (c→a)

$y = x^2$

$y = x^2 + 5$

$y = 3(x^2+5)$

$y = 3((x-2)^2+5)$ → standard form $y = 3x^2 - 12x + 27$

When certain transformations are combined the order DOES matter