



Dilations

Vertical \longrightarrow multiply the whole formula by the factor.

factor < 1 compression

factor > 1 stretch.

ex: $y = -0.5x^2 + 3x - 2$

\downarrow vertical dilation
with factor = 4

$$y = 4 \times (-0.5x^2 + 3x - 2)$$

$$y = -2x^2 + 12x - 8$$

Horizontal \longrightarrow substitute $\left(\frac{1}{\text{factor}} \times x\right)$ for every x

ex: $y = 6x^2 - 9x + 21$

\downarrow horizontal dilation
with factor = 3

Action:
substitute $\left(\frac{1}{3}x\right)$ for
every x

$$y = 6 \cdot \left(\frac{1}{3}x\right)^2 - 9 \left(\frac{1}{3}x\right) + 21$$

$$y = 6 \cdot \frac{1}{9}x^2 - 3x + 21$$

$$y = \frac{2}{3}x^2 - 3x + 21$$