Graphing Exponential Decay

$y = a \cdot (b)^x$ where $0 < b < 1$

Always on the graph: (0, a) and (1, a·b)

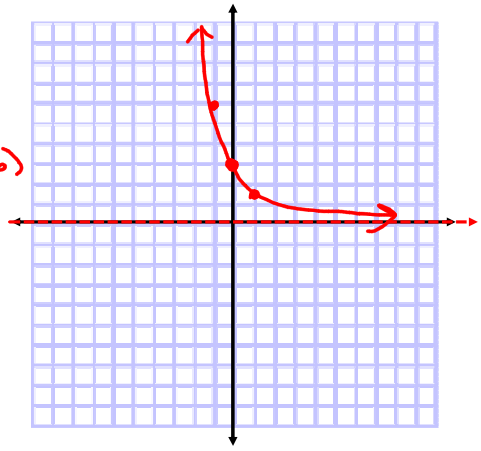
Example: $y = 3\left(\frac{1}{2}\right)^x$

Parent Points:

(0, 3) $\left(1, \frac{3}{2}\right)$

Horiz. Asymptote at $y = 0$

(-1, 6)



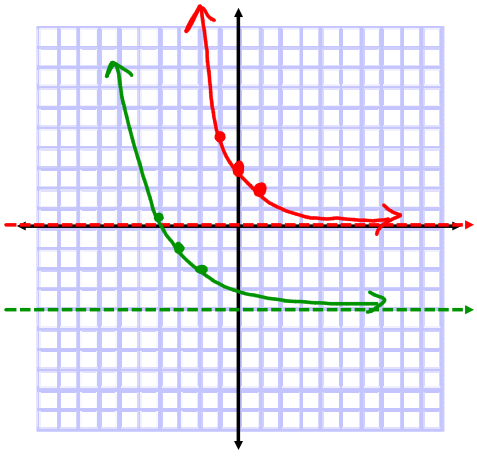
Domain: Real

Range: $y > 0$

Transformations:

$y = 3\,(2/3)^{x+3} - 4$

Parent: $y = 3\left(\frac{2}{3}\right)^x$



Parent Points

Graph (0 , 3)

(1 , 2)

$\left(-1, \frac{9}{2}\right)$

Horiz. Asymptote (H.A.) $y = 0$

New Points:

$y = 3\,(2/3)^{x+3} - 4$

3 units left

4 units down

H.A. = $y = -4$

Domain: Real

Range: $y > -4$

$(0, 3) \rightarrow (-3, -1)$

$(1, 2) \rightarrow (-2, -2)$

$\left(-1, \frac{9}{2}\right) \rightarrow \left(-4, \frac{1}{2}\right)$

$\left(-1, 4\frac{1}{2}\right)$