Determine the exponential equation for the given data.

| x | f(x) |
|---|---|
| -2 | 960 |
| -1 | 240 |
| 0 | 60 |
| 1 | 15 |
| 2 | $\frac{15}{4}$ |

$y = ab^x$

$a$ = initial value

$(x=0)$

$y = 60b^x$

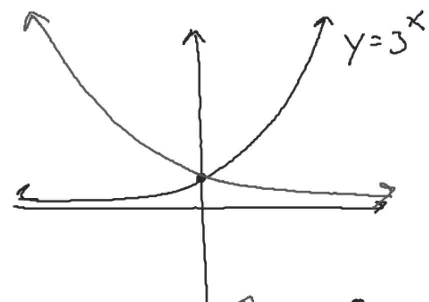
$y = 60\left(\frac{1}{4}\right)^x$

$15 = 60b^1$

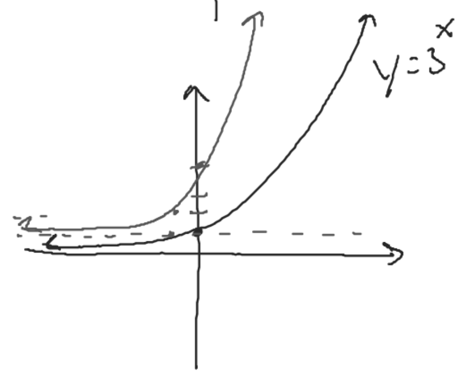
$15 = 60b$

$b = \frac{1}{4}$

| Function | Transformation of $y = 3^x$ | Horizontal asymptote | y-intercept | Increasing or Decreasing |
|---|---|---|---|---|
| $y = 3^{-x}$ | Reflection over y-axis | $y=0$ | $(0,1)$ | Decreasing $(-\infty,\infty)$ |




| Function | Transformation of $y = 3^x$ | Horizontal asymptote | y-intercept | Increasing or Decreasing |
|---|---|---|---|---|
| $y = 3^{x+1} + 1$ | Left 1 up 1 | $y=1$ | $(0,4)$ | Inc $(-\infty,\infty)$ |



State whether the function is an exponential growth function or exponential decay function, and describe its end behaviors using limits.

$b > 1$ Growth

$0 < b < 1$ Decay

$$f(x) = 2\left(\frac{3}{2}\right)^x$$

Growth

$\lim_{x \to \infty} f(x) = \infty$

$\lim_{x \to -\infty} f(x) = 0$

Decide whether the function is exponential growth or exponential decay and find the constant percent of growth or decay.

How much Remaining

$f(x) = 56 \cdot 1.28^x$

Growth 28%

$1.28 - 1 = .28$

$g(x) = 1.2(.64)^x$

Decay 36%

$1 - .64 = .36$

$h(x) = 105(.02)^x$

Decay

98%

$p(x) = 3.85(1.\underline{78})^x$

Growth 78%

Find the logistical function that satisfies the given conditions.

$(0,2)$ $\quad$ x y

Initial value = 2, limit to growth 40, passes through (1, 10)

$$y = \frac{M}{1+Ab^x}$$

M = max value

$$y = \frac{40}{1+Ab^x}$$

$$2 = \frac{40}{1+A}$$

$$1+A = 20$$
$$A = 19$$

$$y = \frac{40}{1+19b^x}$$

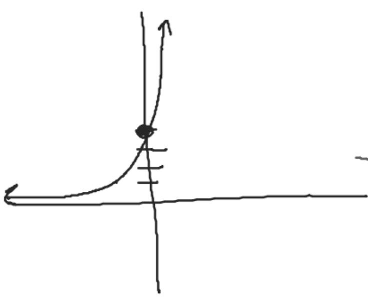
$$10 = \frac{40}{1+19b^1}$$

$$1+19b = 4$$
$$19b = 3$$
$$b = \frac{3}{19}$$

$$y = \frac{40}{1+19\left(\frac{3}{19}\right)^x}$$

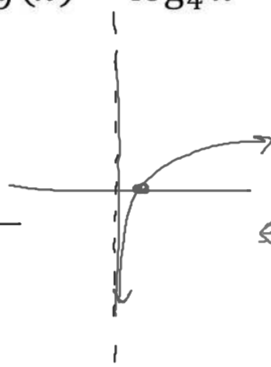
Graph the following functions without a calculator. Find the y-intercept.

$f(x) = 4^{x+1}$



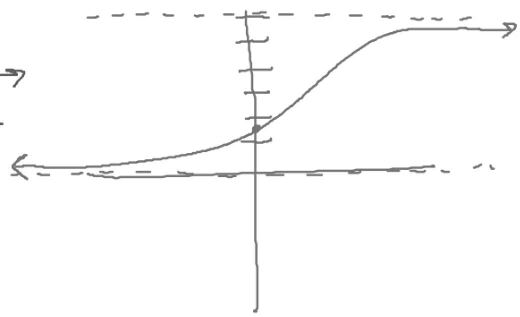
(0,4)

$g(x) = \log_4 x$



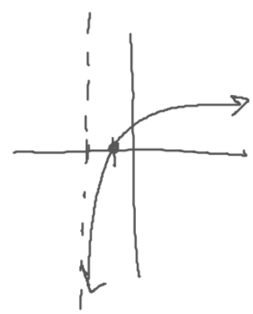
Y-int
None

$h(x) = \frac{12}{1+3\cdot 0.2^x}$



(0,3)

$p(x) = \ln(x+2)$



(0, ln 2)

Describe how to transform the graph of the basic function g(x) into the graph of the given f(x).

$f(x) = 3\ln(3 - x) + 2;$ $g(x) = \ln x$

$3\ln(-x+3)+2$

$3\ln -(x-3)+2$

Vertical Stretch by factor of 3

Reflection over y-axis

Right 3

up 2

Use the properties of logarithms to write the expression as a sum, difference, and and/or constant multiple of logarithms.

$\log\sqrt{\frac{a^5b^2}{c^7}}$

$\log\left(\frac{a^5b^2}{c^7}\right)^{1/2}$

$\frac{1}{2}\left[5\log a + 2\log b - 7\log c\right]$

$\log_4 16x^9$