

## Determining Exponential Equations

$$y = 2^{-x}$$

$$= \frac{1}{2^x}$$

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

$$y = 2^{x+1}$$

$$= 2^x (2^1)$$

$$= 2 \cdot 2^x$$

$$a^x a^y = a^{x+y}$$

$$y = 2^{2x}$$

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

$$= 4^x$$

$$(a^x)^y = a^{xy}$$

$$2^{x+5} = 2^x \cdot 2^5$$

$$= 32 \cdot 2^x$$

$$2^{x-5} = 2^x \cdot 2^{-5}$$

$$= \frac{1}{32} \cdot 2^x$$

Apr 6-9:33 AM

Ex. 1.  $y = a(b)^x + q$

$$\left. \begin{array}{l} b=3 \\ q=-2 \end{array} \right\} y = a(3^x) - 2$$

$(0, 5)$  on curve  
 $\begin{array}{c} x \\ y \end{array}$

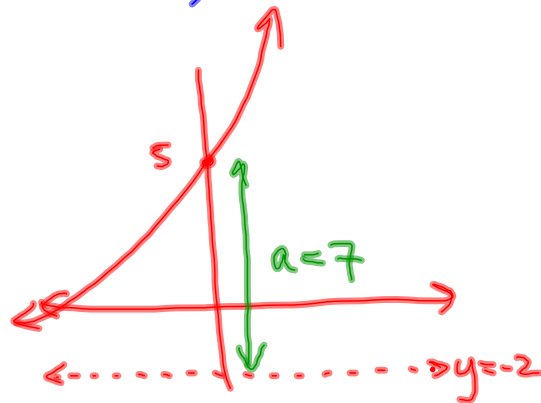
Sub  $(0, 5)$

$$5 = a(3^0) - 2$$

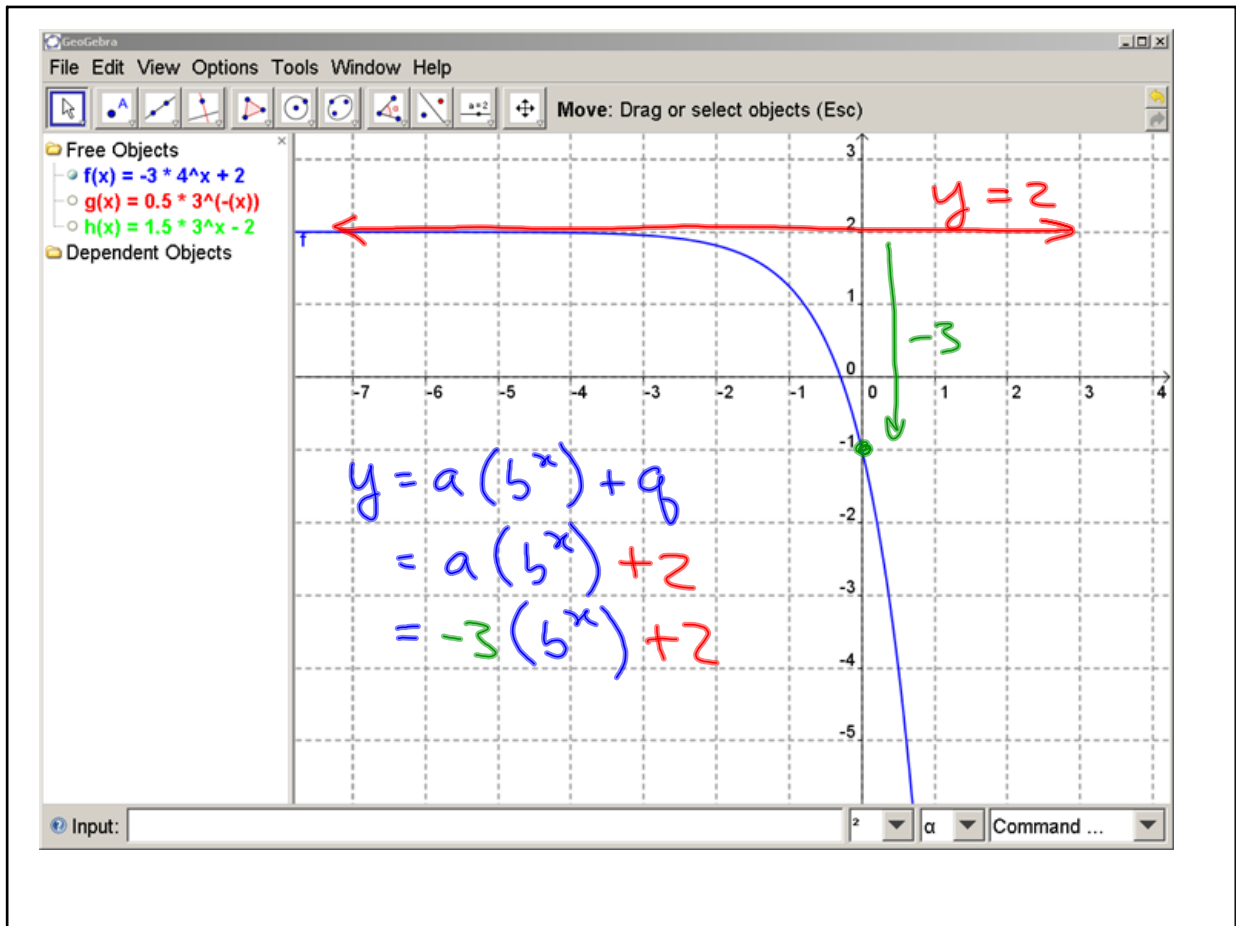
$$5 = a - 2$$

$$a = 7$$

$$\therefore y = 7(3^x) - 2$$



Apr 6-9:41 AM



Apr 6-10:00 AM

Ex. 2.  $y = a(b^x) + q$

$q = 1$   
 $a = -1$

for  $b$ , could sub  $(-1, -1)$

$$-1 = -1(b^{-1}) + 1$$

$$-2 = -b^{-1}$$

$$2 = \frac{1}{b} \quad [\times b]$$

$$2b = 1$$

$$b = \frac{1}{2}$$

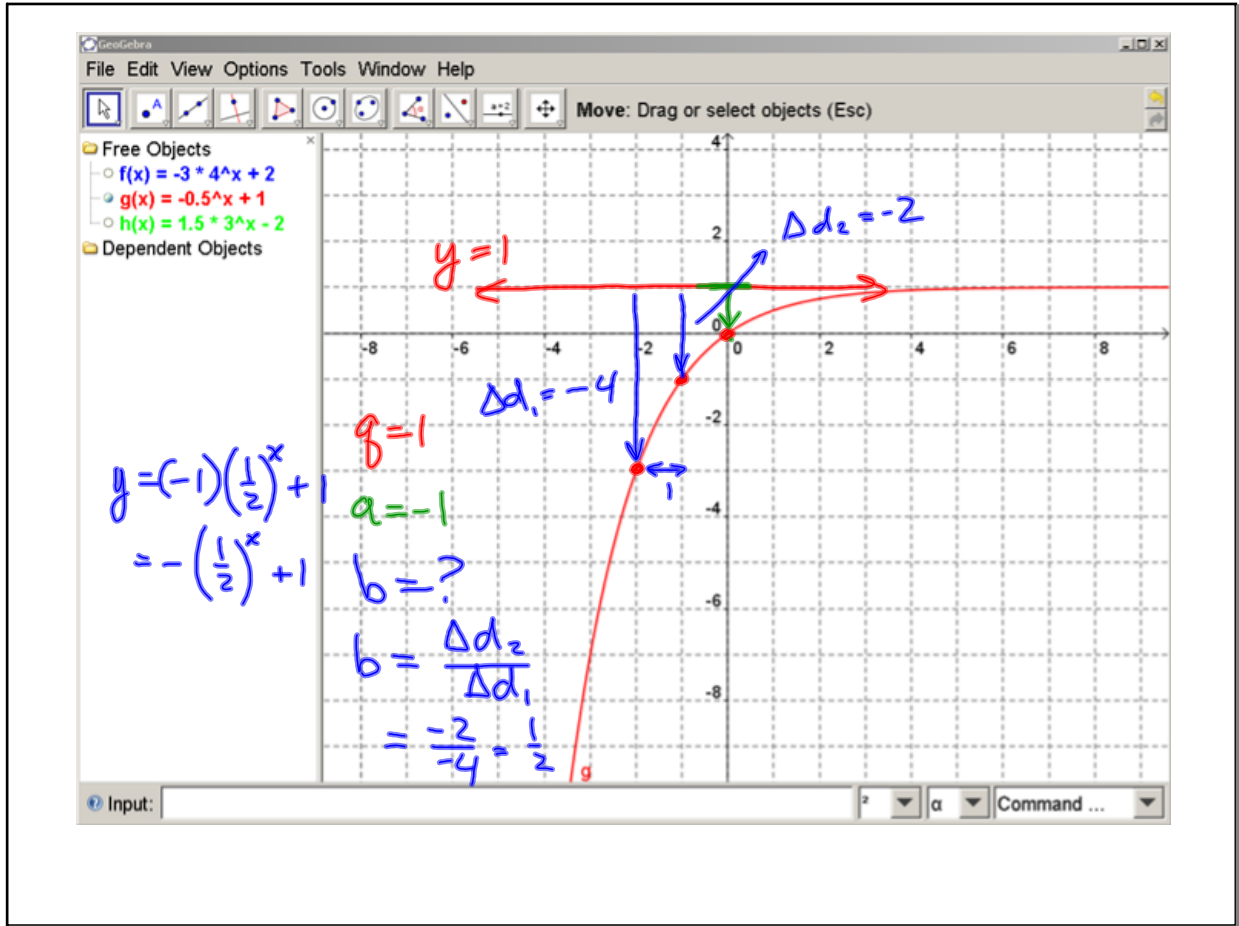
$$y = -\left(\frac{1}{2}\right)^x + 1$$

Graph showing points  $(-2, -3)$ ,  $(-1, -1)$ , and  $(0, 0)$ . A horizontal dashed line is at  $y = 1$ . Vertical arrows indicate distances:  $\Delta d_1 = -4$  (from  $y = 1$  to  $(-1, -1)$ ) and  $\Delta d_2 = -2$  (from  $y = 1$  to  $(-2, -3)$ ). The ratio is calculated as:

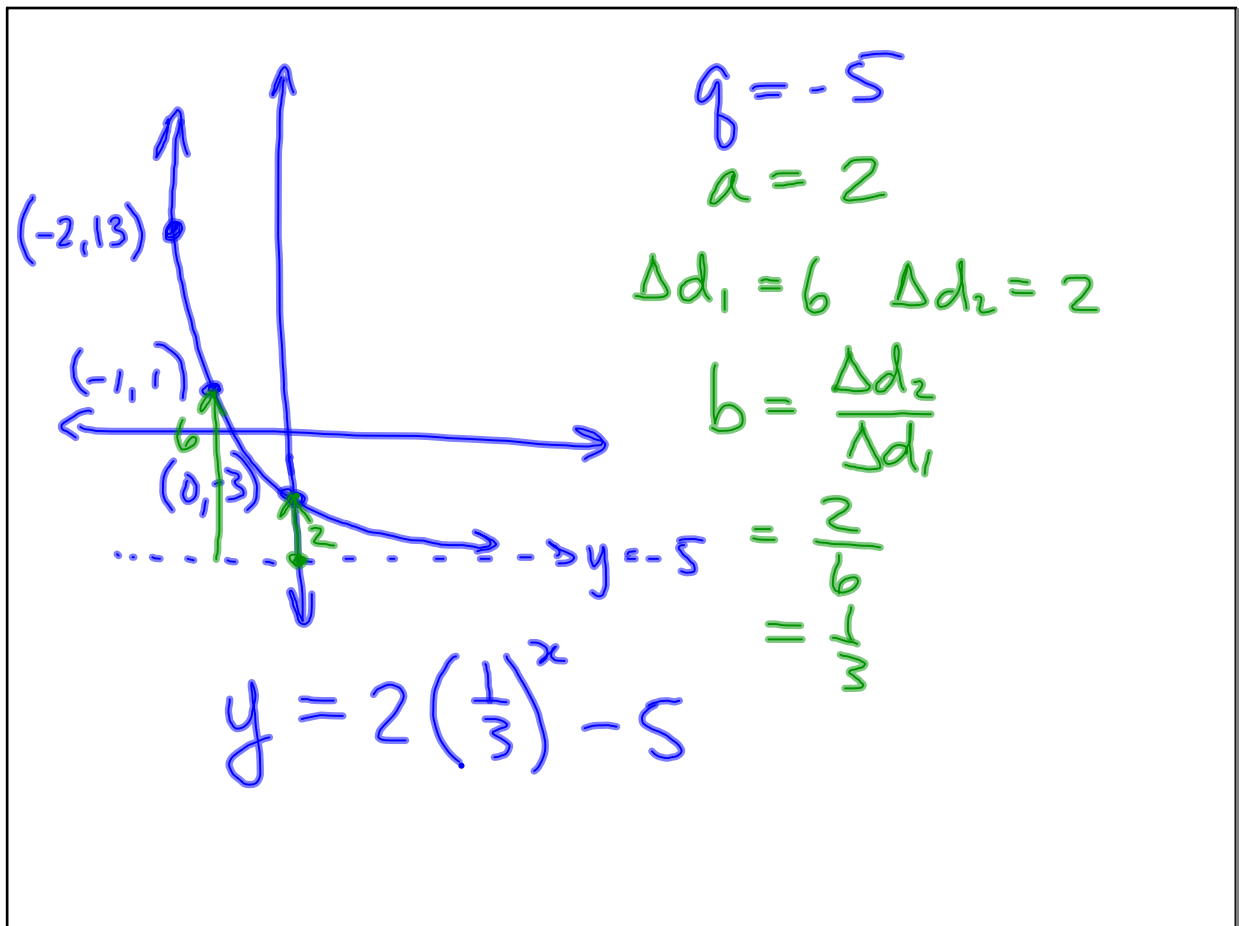
$$\frac{\Delta d_2}{\Delta d_1} = \frac{-2}{-4} = \frac{1}{2}$$

Labels  $x_1 = -2$  to  $x_2 = -1$  are also present.

Apr 6-9:47 AM



Apr 6-10:22 AM



Apr 7-10:32 AM

$$3(b) \quad y = 4\left(\frac{1}{2}\right)^2 + 3$$

$$3(c) \text{ HA: } y = 6 \rightarrow q = 6$$

$$y_{\text{int}}: y = 1 \rightarrow a = -5$$

$$\Delta d_1 = -5 \quad \Delta d_2 = -20$$

$$b = \frac{-20}{-5} \\ = 4$$

$$y = -5(4)^x + 6$$

Apr 7-10:36 AM