

# Stations 1

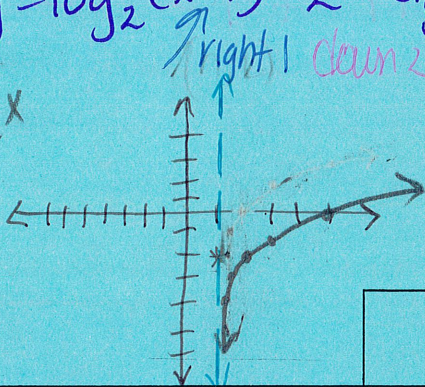
## 4.2-4.5 Renew

Name: \_\_\_\_\_

1  $y = \log_2(x-1) - 2$  Graph State Domain Range

Parent  $y = \log_2 x$   
 $2^y = x$

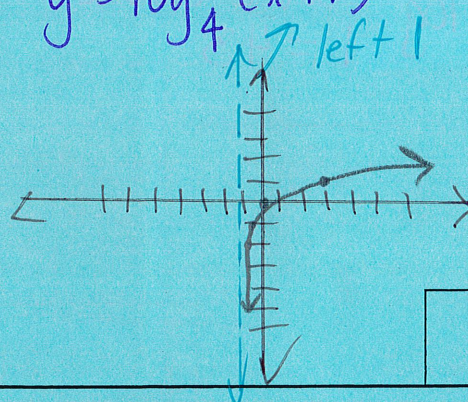
x	y
1/4	-2
1/2	-1
1	0
2	1
4	2



2  $y = \log_4(x+1)$

Parent  $y = \log_4 x$   
 $4^y = x$

x	y
1/6	-2
1/4	-1
1	0
4	1
16	2



3 Expand each log

a)  $\log_3(7^4 \cdot 12)^4$  b)  $\log_3 \frac{12^3}{7^6}$

$\log_3 7^{16} 12^4$        $\log_3 12^3 - \log_3 7^6$

$16 \log_3 7 + 4 \log_3 12$        $3 \log_3 12 - 6 \log_3 7$

4 a)  $\log_4 \frac{2^6}{3^4}$  b)  $\log_8(11^5 \cdot 12^6)$

$\log_4 2^6 - \log_4 3^4$        $\log_8 11^5 + \log_8 12^6$

$6 \log_4 2 - 4 \log_4 3$        $5 \log_8 11 + 6 \log_8 12$

$4^1 = 2$

$6 \cdot \frac{1}{2} - 4 \log_4 3$

$3 - 4 \log_4 3$

5 Condense each log

a)  $8 \log_4 a + 2 \log_4 b$

$\log_4 a^8 + \log_4 b^2 \rightarrow \log_4 a^8 b^2$

b)  $15 \log_2 a - 3 \log_2 b$

$\log_2 a^{15} - \log_2 b^3 \rightarrow \log_2 \frac{a^{15}}{b^3}$

6 a)  $\frac{\log_8 X}{3} + \frac{\log_8 Y}{3} + \frac{\log_8 Z}{3}$

$\frac{1}{3} \log_8 X + \frac{1}{3} \log_8 Y + \frac{1}{3} \log_8 Z$

$\log_8 (XYZ)^{1/3}$        $\log_8 \sqrt[3]{XYZ}$

b)  $18 \log_8 10 + 3 \log_8 3$

$\log_8 10^{18} + \log_8 3^3$

$\log_8 10^{18} \cdot 3^3$        $\log_8 27 \times 10^{18} \rightarrow \log_8 2.7 \times 10^{19}$

7 Solve each log

$25^{2x+2} = 125^{-2x+3}$

$(5^2)^{2x+2} = (5^3)^{-2x+3}$

$5^{4x+4} = 5^{-6x+9}$

$4x+4 = -6x+9$

$+6x \quad -4 \quad +6x \quad -4$

$10x = 5 \quad X = \frac{1}{2}$

8  $-3x-3$

$4^{-3x-3} = 64$

$4^{-3x-3} = 4^3$

$-3x-3 = 3$

$+3 \quad +3$

$-3x = 6 \quad X = -2$

# ★ Stations 1 ★

Name: 4.2-4.5 Review

4.5<sup>2</sup>

A Solve each

$$4 \cdot 4^{-8m} + 1 = 43$$

$$\frac{4 \cdot 4^{-8m}}{4} = \frac{42}{4}$$

$$\frac{-8m \cdot \log 4 = \log(10.5)}{-8 \log 4 = -8 \log 4}$$

$$4^{-8m} = 10.5$$

$$\log 4^{-8m} = \log 10.5$$

$$m = -.21$$

$$m = -.21$$

B  $-2 \cdot 17^{-9n} + 4 = -63$

$$\frac{-2 \cdot 17^{-9n} = -67}{-2} = \frac{-67}{-2}$$

$$17^{-9n} = 33.5$$

$$\ln 17^{-9n} = \ln 33.5$$

$$\frac{-9n \cdot \ln 17 = \ln 33.5}{\ln 17} = \frac{\ln 33.5}{\ln 17}$$

$$\frac{-9n = 1.239}{-9} = \frac{-1.239}{-9}$$

$$n = -.14$$

C Solve  $\log_{13}(-x+6) = \log_{13}(-2x-4)$

This = that

$$\begin{array}{r} -x+6 = -2x-4 \\ +x+4 \quad +x+4 \\ \hline 10 = -x \end{array}$$

$$-10 = x$$

$$x = -10$$

D  $\log_6(5p-9) = \log_6(4p-1)$

This = that

$$\begin{array}{r} 5p-9 = 4p-1 \\ -4p \quad -4p \\ \hline p-9 = -1 \end{array}$$

$$\frac{p-9 = -1}{+9 \quad +9} = \frac{-1+9}{+9}$$

$$p = 8$$

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E  $\log_6 -4x - \log_6 8 = 1$

$$\log_6 \frac{-4x}{8} = 1$$

$$\frac{6^1 = -4x}{1} = \frac{-4x}{8}$$

$$\frac{48 = -4x}{4} = \frac{-4x}{4}$$

$$-12 = x$$

$$x = -12$$

F  $\log_7(x-6) + \log_7 3 = 2$

$$\log_7(x-6)3 = 2$$

$$7^2 = 3x-18$$

$$49 = 3x-18$$

$$\frac{67 = 3x}{+18 \quad +18}$$

$$x = \frac{67}{3} \approx 22.3$$

G pg. 512 Pick one 83, 84, 85

$$A = A_0 e^{rt}$$

$$x = 14.65$$

$$\frac{150,000}{50,000} = \frac{50,000 e}{50,000}$$

$$3 = e^{.075t}$$

$$\ln 3 = \ln e^{.075t}$$

$$\ln 3 = .075t \cdot \ln e$$

It would take 14.65 years for your investment to triple.

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140 days find k

$$A = A_0 e^{kt}$$

$$50 = 100 e^{k(140)}$$

$$\frac{1}{2} = e^{140k}$$

$$\ln(\frac{1}{2}) = \ln e^{140k}$$

$$\ln(\frac{1}{2}) = 140k \cdot \ln e$$

$$-.6931 = k$$

Now Model is

$$A = A_0 e^{-.00495t}$$

$$20 = 100 e^{-.00495t}$$

$$.20 = e^{-.00495t}$$

$$\ln .20 = \ln e^{-.00495t}$$

$$\ln .20 = -.00495t$$

It would take 325 days to decrease to 20%.

$$X = 325.14$$