

# Chapter 8 Review Problems (Basketballs)

Warm-ups

1)  $\log_3 (2x-1) = 5$

$$3^5 = 2x-1$$

$$243 = 2x-1$$

$$244 = 2x$$

$$122 = x$$

2)  $3e^x + 2 = 13$

$$3e^x = 11$$

$$e^x = 11/3$$

$$\ln e^x = \ln 11/3$$

$$x \ln e = \ln 11/3$$

$$x = \ln 11/3$$

$$x = 1.3$$

3)  $\log_4 7 = x$

\*use change of base formula

$$\frac{\log 7}{\log 4} = x$$

$$1.4 = x$$

$$y = ab^x \quad b = 1 + .12$$

$$1800 = 350(1.12)^x \quad b = 1.12$$

$$5.14 = 1.12^x$$

$$\ln 5.14 = \ln 1.12^x$$

$$\ln 5.14 = x \ln 1.12$$

$$\frac{\ln 5.14}{\ln 1.12} = x$$

$$14.45 \text{ years}$$

$$14.45 = x$$

$$2e^{3x-2} = 84$$

$$e^{3x-2} = 42$$

$$\ln e^{3x-2} = \ln 42$$

$$3x-2 \ln e = \ln 42$$

$$3x-2 = \ln 42$$

$$3x-2 = 3.74$$

$$3x = 5.74$$

$$x = 1.91$$

"Mental Math"

$$\log 10^4 = x$$

$$10^x = 10^4$$

$$x = 4$$

$$\log_3 6 = x$$

$$3^x = 6$$

$$x = 1.2$$

$$\log_3 \frac{1}{9} = x$$

$$3^x = \frac{1}{9}$$

$$x = -2$$

$$\log_e e = x$$

$$x = 1$$

$$\ln 1 = x$$

$$e^x = 1$$

$$x = 0$$

$$8 + 3^x = 15$$

$$3^x = 7$$

$$\ln 3^x = \ln 7$$

$$x \ln 3 = \ln 7$$

$$x = \frac{\ln 7}{\ln 3}$$

$$x = 1.77$$

$$A = Pe^{rt}$$

$$3500 = 2000e^{r \cdot 8}$$

$$1.75 = e^{r \cdot 8}$$

$$\ln 1.75 = \ln e^{r \cdot 8}$$

$$\ln 1.75 = r \cdot 8 \ln e$$

$$\frac{\ln 1.75}{8} = r$$

$$.070 = r$$

$$\text{interest rate } 7\%$$

Expand:  $\log_4 \frac{5\sqrt{x}}{y^3}$

$$\log_4 \frac{5x^{1/2}}{y^3} = \log_4 5 + \frac{1}{2} \log_4 x - 3 \log_4 y$$

pendense:  $2 \ln z - \frac{1}{2} (\ln x + 3 \ln y)$

$$\ln z^2 - \frac{1}{2} (\ln x + 3 \ln y)$$

$$\ln z^2 - \ln (xy^3)^{1/2}$$

$$\ln \frac{z^2}{\sqrt{xy^3}}$$

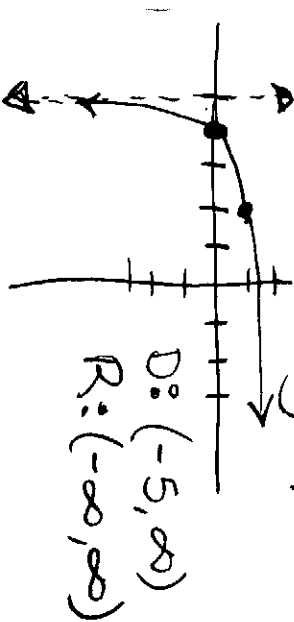
Graph  $y = \log_3 (x+5)$

steps  $(1,0)$   $(3,1)$

$x-5$   $(-4,0)$   $(-2,1)$

$$x = 0 - 5$$

$x = -5$  asymptote



State % of increase or decrease

$$y = 5.3(1.032)^x$$

$$b = 1 + r$$

$$1.032 = 1 + r$$

$$.032 = r$$

3.2% increase

$$y = 7.2(0.27)^x$$

$$b = 1 + r$$

$$.27 = 1 + r$$

$$-.73 = r$$

73% decrease

State Domain + Range

$$y = 2(3)^x \text{ } \textcircled{-4}$$

$$y = 0 - 4$$

$y = -4$  asymptote

$$D: (-\infty, \infty)$$

$$R: (-4, \infty)$$

Solve for X

$$\ln_e(3x+4) = 5$$

$$e^5 = 3x+4$$

$$148.41 = 3x+4$$

$$144.41 = 3x$$

$$48.14 = x$$

Rewrite as a log

$$5^{-3} = \frac{1}{125}$$

$$\log_5 \frac{1}{125} = -3$$