

### Common Logs

Common Logs are any logarithm that is written with the base 10.

Solve each equation or inequality.

$$6^x = 40$$

$$\log_6 6^x = \log_6 40$$

$$x = \log_6 40$$

$$2.1^{a+2} = 8.25$$

$$\log_{2.1} 2.1^{a+2} = \log_{2.1} 8.25$$

$$a+2 = \log_{2.1} 8.25$$

$$a = \log_{2.1} 8.25 - 2$$

$$7^{x^2} = 20.42$$

$$\log_7 7^{x^2} = \log_7 20.42$$

$$\sqrt{x^2} = \sqrt{\log_7 20.42}$$

$$x = \pm \sqrt{\log_7 20.42}$$

$$5^{4n} > 33$$

$$\log_5 5^{4n} > \log_5 33$$

$$\frac{4n}{4} > \frac{\log_5 33}{4}$$

$$n > \frac{\log_5 33}{4}$$

$$6^{p-1} \leq 4^p$$

$$\log_6 6^{p-1} \leq \log_6 4^p$$

$$p-1 \leq \log_6 4^p$$

$$p-1 \leq p \log_6 4$$

$$-1 \leq p \log_6 4 - p$$

$$-1 \leq \frac{p(\log_6 4 - 1)}{\log_6 4 - 1}$$

$$p \geq \frac{-1}{\log_6 4 - 1}$$

Either or



$$\log_4 6^{p-1} \leq \log_4 4^p$$

$$\log_4 6^{p-1} \leq p$$

$$p-1(\log_4 6) \leq p$$

$$\frac{p \log_4 6 - \log_4 6}{-p \log_4 6} \leq p$$

$$-\log_4 6 \leq p - p \log_4 6$$

$$-\log_4 6 \leq \frac{p(1 - \log_4 6)}{1 - \log_4 6}$$

$$p \geq \frac{-\log_4 6}{1 - \log_4 6}$$

Change of base – allows you to write equivalent log expressions that have different bases.

Express each log in terms of common logarithms.

$$\log_3 8$$

$$\frac{\log 8}{\log 3}$$

$$\log_4 23$$

$$\frac{\log 23}{\log 4}$$

p495 23-38, 43-52, 60-63, 68