

Name:

KEY

ID:R

Review 8.4-8.5

1. Expand the logarithmic expression:

$$\log_2 \frac{m}{11} = \log_2 m - \log_2 11$$

2. Expand the logarithmic expression:

$$\log_6 8q^5 = \log_6 8 + 5 \log_6 q$$

3. Write the expression as a single logarithm:

$$5 \log_b t + 6 \log_b q$$

$$\log_b t^5 + \log_b q^6 = \log_b t^5 q^6$$

4. Write the expression as a single logarithm:

$$\log_7 54 - \log_7 9$$

$$\log_7 \frac{54}{9} = \log_7 6$$

5. Use the properties of logarithms to write
- $2 \log_2 3 - \log_2 5$
- as a single logarithm.

$$\log_2 3^2 - \log_2 5 = \log_2 \frac{3^2}{5} \text{ or } \log_2 \frac{9}{5}$$

6. Use the properties of logarithms to write
- $\log_3 9 + \log_3 4 - \log_3 12$
- as a single logarithm.

$$\log_3 \frac{(9 \cdot 4)}{12} = \log_3 \frac{36}{12} = \log_3 3$$

7. Solve
- $10^{3x} = 50$
- .

$$\frac{3x \log 10}{\log 10} = \frac{\log 50}{\log 10}$$

$$3x = 1.6990$$

$$x = 0.5663$$

8. Solve $5^{4x-3} = 360$.

$$\frac{(4x-3) \log 5}{\log 5} = \frac{\log 360}{\log 5}$$

$$4x-3 = 3.6572$$

$$+3 \quad +3$$

$$4x = \frac{6.6572}{4}$$

$$x = 1.6643$$

9. Solve $\frac{1}{16} = 64^{4x-3}$

$$\frac{(4x-3) \log 64}{\log 64} = \frac{\log(1/16)}{\log 64} \quad (0.0625)$$

$$4x-3 = -0.6667$$

$$+3 \quad +3$$

$$4x = 2.3333$$

$$x = 0.5833$$

10. Solve $2 \log_3 x = 12$.

$$\log_3 x = 6$$

$$10^6 = 3x$$

$$1,000,000 = 3x$$

$$x = 333,333.\bar{3}$$

11. Solve $\log_6(3x+12) = 2$.

$$10^2 = 3x+12$$

$$100 = 3x+12$$

$$\begin{array}{r} -12 \quad -12 \\ \hline \end{array}$$

$$88 = 3x$$

$$x = 29.\bar{3}$$

12. Solve $\log 4x + \log 2 = -1$.

$$\log(4x \cdot 2) = -1$$

$$\log_10 8x = -1$$

$$10^{-1} = 8x$$

$$0.1 = 8x$$

$$x = 0.0125$$