

## Solving More Equations with Logs - NOTES

Solve each equation. Round your answers to the nearest ten-thousandth.

1)  $18^r = 65$

$$\text{LOG}_{18} 65 = r$$

$$\frac{\text{LOG } 65}{\text{LOG } 18} = r$$

$$\boxed{1.44 = r}$$

2)  $16^r = 51$

$$\text{LOG}_{16} 51 = r$$

$$\frac{\text{LOG } 51}{\text{LOG } 16} = r$$

$$\boxed{1.418 = r}$$

3)  $14^p + 3 = 60.3$

$$\begin{matrix} -3 & -3 \\ 14^p & = 57.3 \end{matrix}$$

$$14^p = 57.3$$

$$\text{LOG}_{14} 57.3 = p$$

$$\frac{\text{LOG } 57.3}{\text{LOG } 14} = p$$

$$\boxed{1.534 = p}$$

4)  $10^r + 9 = 18$

$$\begin{matrix} -9 & -9 \\ 10^r & = 9 \end{matrix}$$

$$10^r = 9$$

$$\text{LOG}_{10} 9 = r$$

$$\frac{\text{LOG } 9}{\text{LOG } 10} = r$$

$$\boxed{.954 = r}$$

5)  $-4.5 \cdot 8^p - 7 = -94.2$

$$\begin{matrix} +7 & +7 \\ -4.5 \cdot 8^p & = -87.2 \end{matrix}$$

$$-4.5 \cdot 8^p = -87.2$$

$$8^p = 19.4$$

$$\text{LOG}_8 19.4 = p$$

$$\frac{\text{LOG } 19.4}{\text{LOG } 8} = p$$

$$\boxed{1.43 = p}$$

6)  $-6 \cdot 4^n - 7 = -12$

$$\begin{matrix} +7 & +7 \\ -6 \cdot 4^n & = -5 \end{matrix}$$

$$-6 \cdot 4^n = -5$$

$$4^n = .8\bar{3}$$

$$\text{LOG}_4 .8\bar{3} = n$$

$$\frac{\text{LOG } .8\bar{3}}{\text{LOG } 4} = n$$

$$\boxed{-.132 = n}$$

$$7) 3^{n-1} = 65$$

$$\log_3 65 = n - 1$$

$$3.8 = n - 1$$

$$\boxed{4.8 = n}$$

$$8) 18^{-10x} = 12$$

$$\log_{18} 12 = -10x$$

$$.86 = -10x$$

$$\boxed{-.086 = x}$$

$$9) 16^{8-7r} = 96$$

$$\log_{16} 96 = 8 - 7r$$

$$1.65 = 8 - 7r$$

$$-6.35 = -7r$$

$$\boxed{.908 = r}$$

$$10) 4^{2-7b} = 28$$

$$\log_4 28 = 2 - 7b$$

$$2.4 = 2 - 7b$$

$$.4 = -7b$$

$$\boxed{-.06 = b}$$

$$11) 9^{x-3} + 6.1 = 101$$

$$9^{x-3} = 94.9$$

$$\log_9 94.9 = x - 3$$

$$2.07 = x - 3$$

$$\boxed{5.07 = x}$$

$$12) 16^{-7a} - 10 = -4$$

$$16^{-7a} = 6$$

$$\log_{16} 6 = -7a$$

$$.646 = -7a$$

$$\boxed{-.09 = a}$$

$$13) -4 \cdot 7^{-10x-1} - 1 = -87$$

$$-4 \cdot 7^{-10x-1} = -86$$

$$7^{-10x-1} = 21.5$$

$$\log_7 21.5 = -10x - 1$$

$$1.58 = -10x - 1$$

$$2.58 = -10x$$

$$\boxed{-.258 = x}$$

$$14) -3 \cdot 11^{-7n-2} - 4 = -30$$

$$-3 \cdot 11^{-7n-2} = -26$$

$$11^{-7n-2} = 8.\bar{6}$$

$$\log_{11} 8.\bar{6} = -7n - 2$$

$$.901 = -7n - 2$$

$$2.901 = -7n$$

$$\boxed{-.414 = n}$$