

# SOLUTIONS - BONUS LOGARITHM QUESTIONS

P. 376 # 6-44 EVEN NUMBERS

- (6)  $5^2 = 25$        $\log_5 25 = 2$   
 (8)  $8^2 = 64$        $\log_8 64 = 2$   
 (10)  $3^{-2} = 1/9$        $\log_3 (1/9) = -2$   
 (12)  $12^0 = 1$        $\log_{12} (1) = 0$   
 (14)  $81^{3/4} = 27$        $\log_{81} (27) = 3/4$   
 (16)  $(1/2)^{-2} = 4$        $\log_{1/2} (4) = -2$   
 (18)  $\log_{11} 121 = 2$        $11^2 = 121$   
 (20)  $\log_{15} 1 = 0$        $15^0 = 1$   
 (22)  $\log_8 16 = 4/3$        $8^{4/3} = 16$   
 (24)  $\log_{32} (1/8) = -3/5$        $32^{-3/5} = 1/8$   
 (26)  $\log_7 (1/49) = -2$        $7^{-2} = 1/49$   
 (28)  $\log_{1/3} (3) = -1$        $(1/3)^{-1} = 3$   
 (30)  $\log_5 125 = x$   
 $5^x = 125$        $x = 3$   
 (32)  $\log_{16} (1/4) = x$   
 $16^x = 1/4 \Rightarrow (4^2)^x = 4^{-1}$   
 $\Rightarrow 4^{2x} = 4^{-1}$   
 $\Rightarrow 2x = -1$   
 $\Rightarrow x = -1/2$

$$(34) \log_8(N+1) = 3$$

$$8^3 = N+1$$

$$512 = N+1$$

$$\boxed{N = 511}$$

$$(36) \log_7 y = -2$$

$$7^{-2} = y$$

$$y = \frac{1}{7^2} = \boxed{\frac{1}{49}}$$

$$(38) \log_b 625 = 4$$

$$b^4 = 625$$

$$\boxed{b = 5}$$

$$(40) \log_b(4) = 2/3$$

$$b^{2/3} = 4$$

$$(b^{2/3})^{3/2} = 4^{3/2}$$

$$b = (\sqrt{4})^3 = \boxed{8}$$

$$(42) \log_5 5^{2.3} = R+1$$

$$2.3 = R+1$$

$$\boxed{R = 1.3}$$

$$(44) \log_b(1/4) = 1/2$$

$$b^{1/2} = 1/4 \Rightarrow (b^{1/2})^2 = (1/4)^2 \Rightarrow b = \frac{1}{4^2} = \boxed{\frac{1}{16}}$$