

#1 – 8: Write each logarithmic equation in exponential form.

- 1) $\log_3 9 = 2$ 2) $\log_5 525 = 4$ 3) $\log_6 1 = 0$ 4) $\log_{16} 4 = \frac{1}{2}$
 $3^2 = 9$ $5^4 = 525$ $6^0 = 1$ $16^{1/2} = 4$
- 5) $\log_6 \frac{1}{6} = -1$ 6) $\log_{27} 9 = \frac{2}{3}$ 7) $\log_4 4^2 = 2$ 8) $\log_7 7 = 1$
 $6^{-1} = \frac{1}{6}$ $27^{2/3} = 9$ $\frac{2}{3} \log_4 4 = \frac{2}{3}$
 $\log_4 4 = 1$ $4^1 = 4$ $7^1 = 7$

#9 – 16: Write each exponential equation in logarithmic form.

- 9) $6^2 = 36$ 10) $4^3 = 64$ 11) $10^{-3} = 0.001$ 12) $9^0 = 1$
 $\log_6 36 = 2$ $\log_4 64 = 3$ $\log_{10} 0.001 = -3$ $\log_9 1 = 0$
- 13) $8^{3/2} = 16$ 14) $16^{-1/2} = \frac{1}{4}$ 15) $10^2 = 100$ 16) $5^1 = 5$
 $\log_8 16 = 3/2$ $\log_{16} 1/4 = -1/2$ $\log_{10} 100 = 2$ $\log_5 5 = 1$

#17 – 32: Evaluate each logarithm.

- 17) $\log_6 36$ $6^x = 36$
 \downarrow
 2
- 18) $\log_4 64$ $4^x = 64$
 \downarrow
 3
- 19) $\log_9 1$ $9^x = 1$
 \downarrow
 0
- 20) $\log_2 32$ $2^x = 32$
 \downarrow
 5
- 21) $\log_6 6$ $6^x = 6$
 \downarrow
 1
- 22) $\log_8 64$ $8^x = 64$
 \downarrow
 2
- 23) $\log_8 8^{5/3}$ $5/3 \log_8 8$
 $5/3 (1)$
 $5/3$
- 24) $\log_3 \frac{1}{3}$ $3^x = 1/3$
 $x = -1$
 -1
- 25) $\log_{25} 5$ $25^x = 5$
 $\sqrt{25} = 5$
 \downarrow
 $1/2$
- 26) $\log_4 2$ $4^x = 2$
 $\sqrt{4} = 2$
 \downarrow
 $1/2$
- 27) $\log_{125} 5$ $125^x = 5$
 \downarrow
 $1/3$
- 28) $\log_{16} 64$ $16^x = 64$
 \vdots
 $16^{1/2} = 4 \dots 4^3 = 64$
 \downarrow
 $1/2 \cdot 3$
 $3/2$
- 29) $\log_5 (\log_6 6)$ $\log_5 (1)$
 \downarrow
 0
- 30) $\log_2 (\log_5 25)$ $\log_2 (2)$
 \downarrow
 1
- 31) $\log_2 (\log_2 16)$ $\log_2 (4)$
 \downarrow
 2
- 32) $\log_3 (\log_3 27)$ $\log_3 (3)$
 \downarrow
 1