

Unit 5 pg. 8

①  $4^x = 24$

$$\frac{x \log 4 = \log 24}{\log 4} \quad \frac{\log 24}{\log 4}$$

$$x = \log_4 24$$

④  $7^{x-2} = 5^{3-x}$

$$\log 7^{x-2} = \log 5^{3-x}$$

$$x \log 7 - 2 \log 7 = 3 \log 5 - x \log 5$$

$$x \log 7 + x \log 5 = 3 \log 5 + 2 \log 7$$

$$x (\log 7 + \log 5) = 3 \log 5 + 2 \log 7$$

$$x = \frac{3 \log 5 + 2 \log 7}{\log 7 + \log 5}$$

Write in logarithmic form

①  $4^3 = 64$

$$\log_4 64 = 3$$

②  $125^{1/3} = 5$   
 $\log_{125} 5 = \frac{1}{3}$

Write in Exponential Form

③  $\log_{10} 0.01 = -2$   
 $10^{-2} = 0.01$

④  $\log_7 49 = 2$   
 $7^2 = 49$

Evaluate

⑤  $\log_3 \frac{1}{9}$   
 $3^x = \frac{1}{9}$   
 $x = -2$

⑥  $\log_{10} 1000$   
 $10^x = 1000$   
 $x = 3$

⑦  $\log_2 32$   
 $2^x = 32$   
 $x = 5$

⑧  $\log_8 64$   
 $8^x = 64$   
 $x = 2$

⑨  $\log_6 1$   
 $6^x = 1$   
 $x = 0$

③  $13^x = 5^{x+2}$

$$\log 13^x = \log 5^{x+2}$$

$$x \log 13 = x \log 5 + 2 \log 5$$

$$-x \log 5 + x \log 13 = 2 \log 5$$

$$x (\log 13 - \log 5) = 2 \log 5$$

$$x = \frac{2 \log 5}{\log 13 - \log 5}$$

⑩  $\log_9 27$

$$9^x = 27$$

$$(3^2)^x = 3^3$$

$$2x = 3$$

$$x = \frac{3}{2}$$

Solve each equation

$$(11) \log_5 25 = x$$

$$5^x = 25$$

$$x = 2$$

$$(12) \log_2 x = -3$$

$$2^{-3} = x$$

$$\frac{1}{8} = x$$

$$(13) \log_{12} x = -1$$

$$12^{-1} = x$$

$$\frac{1}{12} = x$$

$$(14) \log_8 x = \frac{2}{3}$$

$$8^{2/3} = x$$

$$4 = x$$

$$(15) \log_x 4 = \frac{1}{2}$$

$$(x^{1/2})^2 = (4)^2$$

$$x = 16$$

$$(16) \log_3 243 = x$$

$$3^x = 243$$

$$x = 5$$