

$$\log x = \log 4 + \log 9 - \log 12 \quad (1)$$

$$\log x = \log\left(\frac{4 \cdot 9}{12}\right)$$

$$\boxed{x = 3}$$

$$\log_9 x = \frac{1}{2} + \log_9 2 \quad (14)$$

$$\log_9 x - \log_9 2 = \frac{1}{2}$$

$$\log_9 \frac{x}{2} = \frac{1}{2}$$

$$9^{\frac{1}{2}} = \frac{x}{2}$$

$$3 = \frac{x}{2} \quad | \cdot 2$$

$$3 = \bar{2} \quad 1 \dots$$

$$\boxed{x = 6}$$

$$\log_4 40 - \log_4 5 \quad (20)$$

$$\log_4 8 = x$$

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

$$2x = 3$$

$$x = 1.5$$

$$\log_3 X = \frac{1}{2} \log_3 100 + \frac{3}{4} \log_3 16 \quad (38)$$

$$\log_3 X = \log_3 100^{\frac{1}{2}} + \log_3 16^{\frac{3}{4}}$$

$$x = \log_3 10 + \log_3 8$$

$$\log_3 x = \log_3 10 + \log_3 8$$

$$\log 40 + 2\log 10 - \frac{2}{3}\log 8 \quad (45)$$

$$x = 80$$

$$2\log 2 + 2\log 5 \quad (39)$$

$$\log 2^2 + \log 5^2$$

$$\log 100 = x$$

$$10^x = 100$$

$$x = 2$$

$$\log 40 + 2\log 10 - \frac{2}{3}\log 8 \quad (45)$$

$$\log 40 + \log 100 - \log 4$$

$$\log 1000 = x$$

$$10^x = 1000$$

$$x = 4$$

$$\frac{\log 8}{\log 2} = (51)$$

$$\log 8 \div \log 2$$

$$\log_2 8 = x$$

$$2^x = 8$$

$$2^x = 2^3$$

$$x = 3$$

$$\frac{\log 32}{\log 4} \quad (55)$$

$$\log_4 32 = x$$

$$4^x = 32$$

$$2^{2x} = 2^5$$

$$x = 2.5$$

$$\frac{\log 4 - 2\log 6}{\log 3} \quad (58)$$

$$\log_3 4 - \log_3 6^2$$

$$\log_3 \left(\frac{1}{9} \right) = x$$

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

$$x = -2$$

$$\frac{2\log 2 + 2\log 3}{\log 30 - \log 5} \quad (59)$$

$$\log_6 4 + \log_6 9 =$$

$$6^x = 36$$

$$6^x = 6^2$$

$$x = 2$$