

$$1. X = \log_{\frac{1}{x^{17}}} x^{-19} = \log_x - 17x^{-19} = \frac{19}{17}$$

$$Y = \log_x - 17x^{19} = -\frac{19}{17}$$

$$Z = \log_x 19x^{-17} = -\frac{17}{19}$$

$$X > Z > Y$$

Cevap: B

$$2. \log_x (e^{2\ln x} \cdot 100^{\log x}) =$$

$$\log_x (e^{\ln x^2} \cdot 100^{\log x})$$

$$\log_x (x^{2\log_e e} \cdot x^{\log 100}) = \log_x (x^2 \cdot x^{\log 10^2})$$

$$= \log_x (x^2 \cdot x^2) = \log_x x^4$$

$$= 4 \cdot \log_x x = 4$$

Cevap: B

$$3. \underbrace{\log_a b}_1 + \underbrace{\log_b a}_1 = 2$$

$$\log_a b = 1 \text{ ise } a = b$$

$$\frac{2a + b}{a + 2b} = \frac{2a + a}{a + 2a} = \frac{3a}{3a} = 1$$

Cevap: C

$$4. \log 60 = \log(2^2 \cdot 3 \cdot 5) = 2\log 2 + \log 3 + \log 5 \\ = 2a + b + c$$

Cevap: D

$$5. f(x) = \log_5 e^{5x}$$

$$f'(x) = \frac{5 \cdot e^{5x}}{e^{5x}} \cdot \frac{1}{\ln 5} = \frac{5}{\ln 5}$$

Cevap: A

$$6. F(x, y) = \log\left(\frac{x}{y}\right)$$

$$F(10, 100) = \log \frac{10}{100} = \log \frac{1}{10} = \log 10^{-1} = -1$$

Cevap: B

$$7. f(x) = \log_5 (x - 2)$$

$$y = \log_5 (x - 2)$$

$$x = \log_5 (y - 2)$$

$$y - 2 = 5^x$$

$$y = f^{-1}(x) = 5^x + 2$$

$$f^{-1}(2) = 5^2 + 2 = 27$$

Cevap: D

$$8. x + y = 5 \text{ için}$$

$$x = 3 \text{ alalım.}$$

$$3 + y = 5 \quad y = 2 \text{ olur.}$$

$$f(x) = \log_a (4x - a) \text{ için}$$

$$2 = \log_a (4 \cdot 3 - a)$$

$$2 = \log_a 12 - a$$

$$a^2 = 12 - a$$

$$a = 3$$

Cevap: D

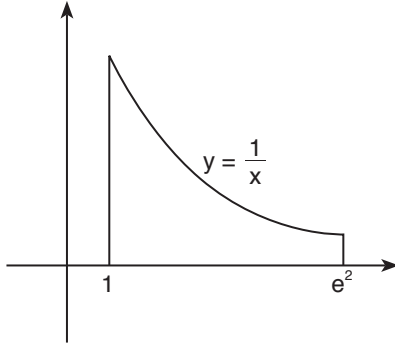
$$9. f(1) = \log_a (3^{1-1}) = 1$$

$$\log_a^2 = 1 \Rightarrow a = 2$$

$$\log_a 4^a = \log_2 4^2 = \frac{1}{4}$$

Cevap: E

10.



$$A = \int_1^{e^2} \frac{1}{x} dx = \ln \Big|_1^{e^2} = \ln e^2 - \ln 1 = 2$$

Cevap: A

$$11. \log_{12} 24 = \frac{\log_2 24}{\log_2 12} = \frac{\log_2 3 + \log_2 8}{\log_2 3 + \log_2 4}$$

$$= \frac{\log_2 3 + 3 \log_2 2}{\log_2 3 + 2 \log_2 2} = \frac{x+3}{x+2}$$

$$12. \log_x 4 = 3 \Rightarrow x^3 = 4 \Rightarrow x = \sqrt[3]{4}$$

$$\log_2 x = y \Rightarrow \log_2 \sqrt[3]{4} = \log_2 2^{\frac{2}{3}} = \frac{2}{3} = y$$

$$3x^3 \cdot y = 3 \cdot (\sqrt[3]{4})^3 \cdot \frac{2}{3} = 3 \cdot 4 \cdot \frac{2}{3} = 8$$

Cevap: B

$$13. \log_x 2 = \log_{2x} 8$$

$$\log_x 2 = \frac{1}{\log_8 2x}$$

$$\log_x 2 \cdot \log_8 2x = 1$$

$$\log_x 2 \cdot \log_2 3^{2x} = 1$$

$$\log_x 2 \cdot \frac{1}{3} \cdot \log_2 2x = 1$$

$$\log_x 2x = 3 \Rightarrow \log_x 2 + 1 = 3$$

$$\Rightarrow \log_x 2 = 2 \Rightarrow x^2 = 2$$

$$x = \sqrt{2}$$

Cevap: D

Cevap: B

$$14. \log_6 40 = \log_6 5 + \log_6 2^3 = \log_6 5 + 3 \log_6 2$$

$$= \frac{1}{\log_5 6} + \frac{3}{\log_2 6}$$

$$= \frac{1}{\log_5 2 + \log_5 3} + \frac{3}{\log_2 2 + \log_2 3}$$

$$= \frac{1}{\log_5 2 + \log_5 3} + \frac{3}{1 + \log_2 3} \dots\dots\dots \textcircled{1}$$

$$\log_3 2 = a$$

$$\log_9 5 = b \Rightarrow \log_3 2^5 = b \Rightarrow \frac{1}{2} \log_3 5 = b$$

$$\Rightarrow \log_3 5 = 2b$$

$$\log_3 2 = a$$

$$x \log_5 3 = \frac{1}{2b}$$

$$\log_5 2 = \frac{a}{2b}$$

O halde  $\textcircled{1}$  de yerine yazılırsa

$$= \frac{1}{\frac{a}{2b} + \frac{1}{2b}} + \frac{3}{1 + \frac{1}{a}}$$

$$= \frac{2b}{a+1} + \frac{3a}{a+1} = \frac{2b+3a}{a+1}$$

Cevap: E

$$15. \log_3 8 = x$$

$$\log_9 24 = \frac{\log_3 24}{\log_3 9} = \frac{\log_3 3 + \log_3 8}{\log_3 3^2} = \frac{1+x}{2}$$

Cevap: E

$$16. \log_2 3 \cdot \log_3 4 \cdot \log_4 5 \cdot \dots \cdot \log_{63} 64$$

$$= \frac{\log_3}{\log_2} \cdot \frac{\log_4}{\log_3} \cdot \dots \cdot \frac{\log_{64}}{\log_{63}}$$

$$= \frac{\log_{64}}{\log_2} = \log_2 64 = \log_2 2^6 = 6$$

Cevap: C

$$17. \log_4 a + \log_2 b = \frac{5}{2}$$

$$\log_4 b - \log_2 a = \frac{1}{2}$$

$$\log_4 a + \log_2 b = \log_2 2^a + \log_2 b = -\frac{5}{2}$$

$$\frac{1}{2} \cdot \log_2 a + \log_2 b = \frac{5}{2}$$

$$\boxed{\log_2 a + 2 \log_2 b = 5}$$

$$\log_4 b - \log_2 a = \frac{1}{2}$$

$$\log_2 2^b - \log_2 a = \frac{1}{2}$$

$$\frac{1}{2} \log_2 b - \log_2 a = \frac{1}{2}$$

$$\boxed{\log_2 b - 2 \log_2 a = 1}$$

$$2/ \log_2 a + 2 \log_2 b = 5$$

$$\log_2 b - 2 \log_2 a = 1$$

$$2 \cdot \log_2 a + 4 \cdot \log_2 b = 10$$

$$+ \log_2 b - 2 \log_2 a = 1$$

$$5 \cdot \log_2 b = 11$$

$$\log_2 b = \frac{11}{5} \Rightarrow 2^{\frac{11}{5}} = b$$

$$\log_2 b - 2 \cdot \log_2 a = 1$$

$$\frac{11}{5} - 2 \cdot \log_2 a = 1$$

$$\frac{11}{5} - 1 = 2 \log_2 a$$

$$\frac{6}{5} = 2 \log_2 a$$

$$\frac{3}{5} = \log_2 a$$

$$a = 2^{\frac{3}{5}}$$

$$a^3 \cdot b = \left(2^{\frac{3}{5}}\right)^3 \cdot 2^{\frac{11}{5}}$$

$$= 2^{\frac{9}{5}} \cdot 2^{\frac{11}{5}} = 2^{\frac{20}{5}} = 2^4 = 16$$

Cevap: D

$$18. \log_{abc} b = 3$$

$$\log_{abc} c = 4$$

$$\log_{abc} a = x$$

$$\log_{abc} a \cdot b \cdot c = \log_{abc} a + \log_{abc} b + \log_{abc} c$$

$$1 = x + 3 + 4$$

$$1 - 7 = x$$

$$-6 = x$$

Cevap: B

$$19. \log_2 x = 5$$

$$2^5 = x$$

$$\boxed{x = 32}$$

$$\log_{\sqrt{3}} y = 4$$

$$(\sqrt{3})^4 = y$$

$$\boxed{y = 9}$$

$$x + 2y = 32 + 2 \cdot 9 = 32 + 18 = 50$$

Cevap: A

$$20. \log_7 35 = \log_7 5 + \log_7 7$$

$$= \frac{1}{a} + 1 = \frac{a+1}{a}$$

Cevap: B