

$$\begin{aligned}
 1. \quad a^{3b} &= b^a & (a = 6b) \\
 (6b)^{3b} &= b^{6b} \\
 (6b)^{3b} &= (b^2)^{3b} \Rightarrow 6b = b^2 \\
 b &= 6 \Rightarrow a = 6 \cdot 6 = 36 \\
 \text{ve } a + b &= 36 + 6 = 42 \text{ olur.}
 \end{aligned}$$

Cevap: A

$$\begin{aligned}
 2. \quad 0,83 &= \frac{8}{10^a} + \frac{3}{10^b} \\
 \frac{83}{100} &= \frac{8}{10^a} + \frac{3}{10^b} \\
 \frac{80}{100} + \frac{3}{100} &= \frac{8}{10^a} + \frac{3}{10^b} \\
 \frac{8}{10^1} + \frac{3}{10^2} &= \frac{8}{10^a} + \frac{3}{10^b}
 \end{aligned}$$

$$\begin{aligned}
 \Rightarrow a &= 1 \text{ ve } b = 2 \text{ olur.} \\
 a \cdot b &= 1 \cdot 2 = 2
 \end{aligned}$$

Cevap: B

$$\begin{aligned}
 3. \quad x^{6x} &= 64^2 \\
 x^{6x} &= (2^6)^2 \\
 x^{6x} &= 2^{6 \cdot 2} \Rightarrow x = 2 \text{ olur.}
 \end{aligned}$$

Cevap: A

$$\begin{aligned}
 4. \quad \bullet \quad m &= 1 + 7^x \Rightarrow 7^x = m - 1 \Rightarrow 7^{-x} = \frac{1}{m-1} \\
 \bullet \quad n &= 2 - 7^{-x} \Rightarrow 7^{-x} = 2 - n \\
 \frac{1}{m-1} &= 2 - n \\
 m - 1 &= \frac{1}{2-n} \\
 m &= 1 + \frac{1}{2-n} \\
 m &= \frac{2-n+1}{2-n} = \frac{3-n}{2-n}
 \end{aligned}$$

Cevap: E

$$5. \quad (3x - 1)^{20} = (x + 5)^{20}$$

$$\begin{aligned}
 \text{i) } 3x - 1 &= x + 5 & \text{ii) } 3x - 1 &= -x - 5 \\
 2x &= 6 & 4x &= -4 \\
 x &= 3 & x &= -1 \\
 \Rightarrow x \text{ değerleri çarpımı } & -1 \cdot 3 = -3 \text{ olur.}
 \end{aligned}$$

Cevap: B

$$\begin{aligned}
 6. \quad \bullet \quad 3^x &= 5^y \Rightarrow 3^{\frac{x}{x}} = 5^{\frac{y}{x}} \\
 & & 5^{\frac{y}{x}} &= 3 \\
 \bullet \quad 25^{\frac{y}{x}} &= \left(5^{\frac{y}{x}}\right)^2 = 3^2 = 9 \text{ olur.}
 \end{aligned}$$

Cevap: D

$$\begin{aligned}
 7. \quad \bullet \quad 3^x &= 5^y \Rightarrow 3^{\frac{x}{x}} = 5^{\frac{y}{x}} \Rightarrow 5^{\frac{y}{x}} = 3 \\
 \bullet \quad 2^a &= 3^b \Rightarrow 2^{\frac{a}{a}} = 3^{\frac{b}{a}} \Rightarrow 3^{\frac{b}{a}} = 2 \\
 & & \frac{5^{\frac{y}{x}} + 3^{\frac{b}{a}}}{5^{\frac{y}{x}} + 3^{\frac{b}{a}}} &= 5
 \end{aligned}$$

Cevap: C

$$\begin{aligned}
 8. \quad 7^{x+1} \cdot 5^{x-1} &= 7^x \cdot 7 \cdot 5^x \cdot \frac{1}{5} \\
 &= 35^x \cdot \frac{7}{5} \quad (35^x = 25) \\
 &= 25 \cdot \frac{7}{5} \\
 &= 35 \text{ olur.}
 \end{aligned}$$

Cevap: B

9. • $3^{2a+6b} = 49^a$
 $3^{2a} \cdot 3^{6b} = 7^{2a}$
 $3^{6b} = \frac{7^{2a}}{3^{2a}} \Rightarrow 3^{6b} = \left(\frac{7}{3}\right)^{2a}$
 $\Rightarrow 3^{3b} = \left(\frac{7}{3}\right)^a$

• $\left(\frac{7}{3}\right)^{\frac{a}{b}} = 3^{3b} \cdot \frac{1}{b} = 3^3 = 27$

Cevap: D

10. • $a^{x+1} = b^{x-1}$
 $a^x \cdot a = b^x \cdot \frac{1}{b} \Rightarrow a \cdot b = \frac{b^x}{a^x}$
 $\left(\frac{b}{a}\right)^x = a \cdot b$

• $\left(\frac{b}{a}\right)^{2-3x} = \left(\frac{b}{a}\right)^2 \cdot \left(\frac{b}{a}\right)^{-3x}$
 $= \frac{b^2}{a^2} \cdot \left(\left(\frac{b}{a}\right)^x\right)^{-3}$
 $= \frac{b^2}{a^2} \cdot (a \cdot b)^{-3} = \frac{b^2}{a^2} \cdot \frac{1}{a^3 \cdot b^3} = \frac{1}{a^5 \cdot b}$

Cevap: C

11. $a^{10} - b^{10} = (3^{0,3})^{10} - (2^{0,2})^{10}$
 $= 3^3 - 2^2$
 $= 27 - 4$
 $= 23$

Cevap: A

12. $25^x + 5^x = 42$
 $25^x + 5^x - 42 = 0$
 $(5^x)^2 + 5^x - 42 = 0 \quad (5^x = a \text{ olsun})$
 $a^2 + a - 42 = 0$
 $(a - 6) \cdot (a + 7) = 0$
 $a = 6 \text{ ve } a = -7$
 $\Rightarrow 5^x = 6 \text{ olur.}$
O halde $\frac{1}{5^x} = \frac{1}{6}$ 'dir.

Cevap: D

13. • $2^{3a+1} = (200)^a$
 $2^{3a} \cdot 2 = (2^3 \cdot 5^2)^a$
 $2^{3a} \cdot 2 = 2^{3a} \cdot 5^{2a}$
 $5^{2a} = 2$
• $(625)^a = 5^{4a} = (5^{2a})^2 = 2^2 = 4 \text{ olur.}$

Cevap: C

14. • $4^a \cdot 4^1 = 100 \Rightarrow 4^a = 25$

• $16^{a-b} = 10^4$
 $(4^a)^2 \cdot 16^{-b} = 10^4 \quad (4^a = 25)$
 $(25)^2 \cdot 16^{-b} = 5^4 \cdot 2^4$
 $5^4 \cdot 2^{-4b} = 5^4 \cdot 2^4$
 $-4b = 4$
 $b = -1 \text{ olur.}$

Cevap: C