

$$1. \left[ \left( \frac{1}{-5^2} \right)^2 \cdot (5^{-3})^{\frac{1}{3}} \right] = 5^1 \cdot 5^1$$

$$= 5^2$$

$$= 25 \text{ bulunur.}$$

$$2. \frac{(-a^3)(-a)^3(-a)^2(-a^2)}{(-a)^9(-a^9)(-a^4)(-a)^4} = \frac{a^6 \cdot a^2(-a^2)}{a^{18} \cdot (-a^4) \cdot a^4}$$

$$= \frac{a^{10}}{a^{26}}$$

$$= a^{-16}$$

$$= \frac{1}{a^{16}} \text{ bulunur.}$$

$$3. 4^y = a \rightarrow 2^{2y} = a$$

$$125^y = b \rightarrow 5^{3y} = b$$

$$2000^y = (2 \cdot 10^3)^y$$

$$= (2 \cdot 2^3 \cdot 5^3)^y$$

$$= 2^{4y} \cdot 5^{3y}$$

$$= (2^{2y})^2 \cdot 5^{3y}$$

$$= a^2 \cdot b \text{ bulunur.}$$

$$4. \frac{9^x + 9^x + 9^x + 9^x}{3^x + 3^x} = 162$$

$$\frac{4 \cdot 3^{2x}}{2 \cdot 3^x} = 162$$

$$\frac{2 \cdot 3^x \cdot 3^x}{3^x} = 2 \cdot 3^4$$

$$3^x = 3^4$$

$$x = 4 \text{ bulunur.}$$

$$5. 2^{-b} = \frac{1}{a} \rightarrow 2^b = a$$

$$32^{b-1} = (2^5)^{b-1}$$

$$= 2^{5b} \cdot 2^{-5}$$

$$= (2^b)^5 \cdot 2^{-5}$$

$$= a^5 \cdot 2^{-5}$$

$$= \frac{a^5}{32} \text{ bulunur.}$$

$$6. 2^{2x+y} = 4$$

$$8^{2x+2y} = 16 \rightarrow 2^{6x+6y} = 4^2$$

$$\frac{2x+y}{6x+6y} = \frac{1}{2}$$

$$4x + 2y = 6x + 6y \rightarrow -4y = 2x \rightarrow x = -2y \text{ olur.}$$

$$\frac{x+6y}{x-2y} = \frac{-2y+6y}{-2y-2y} = \frac{4y}{-4y} = -1 \text{ bulunur.}$$

$$7. \left( 35 \cdot y^{\frac{1}{y}} \right)^y = 7^y \cdot x^y \cdot y$$

$$7^y \cdot 5^y \cdot y = 7^y \cdot x^y \cdot y$$

$$5^y = x^y \rightarrow x = 5 \text{ bulunur.}$$

$$8. \frac{5 \cdot 3^{a+1} - 4 \cdot 3^{a-1}}{3^{a+1} + 8 \cdot 3^a} = \frac{3^a \left( 5 \cdot 3 - \frac{4}{3} \right)}{3^a (3 + 8)}$$
$$= \frac{41}{11}$$
$$= \frac{41}{33} \text{ bulunur.}$$

$$9. (3x - 1)^4 = (2x + 1)^4$$

$$3x - 1 = 2x + 1 \rightarrow x = 2$$

$$-3x + 1 = 2x + 1 \rightarrow x = 0$$

x değerler çarpımı  $0 \cdot 2 = 0$  bulunur.

$$10. (x^b)^{a-b} \cdot (x^a)^{-a-b} = x^{ab} \cdot x^{-b^2} \cdot x^{-a^2} \cdot x^{-ab}$$
$$= x^{-a^2-b^2} \text{ bulunur.}$$