**1.** $\dfrac{1,2.10^{-28}+0,18.10^{-27}}{0,5.10^{-29}}$

$\dfrac{12.10^{-29}+18.10^{-29}}{5.10^{-30}} = \dfrac{10^{-29}(12+18)}{5.10^{-30}}$

$= \dfrac{30.10^{-29}}{5.10^{-30}}$

$= 6.10^{1}$

$= 60$

**Cevap: E**

**2.** $2^{x+1} + 6.2^{x} + 4.2^{x-1} = 160$

$2^{x}\left(2+6+4.\dfrac{1}{2}\right) = 160$

$2^{x}.10 = 160$

$2^{x} = 16 = 2^{4}$

$x = 4$ olur.

**Cevap: C**

**3.** $\left(\dfrac{0,015}{0,005}\right)^{m-4} = (27)^{2-m}$

$3^{m-4} = (3^{3})^{2-m}$

$3^{m-4} = 3^{6-3m}$

$m - 4 = 6 - 3m$

$4m = 10$

$m = \dfrac{5}{2}$ olur.

**Cevap: D**

**4.** $\dfrac{5^{\frac{1}{x}}}{25^{\frac{2}{x}}} = \dfrac{1}{25}$

$\dfrac{5^{\frac{1}{x}}}{5^{\frac{4}{x}}} = 5^{-2}$

$5^{\frac{1}{x}-\frac{4}{x}} = 5^{-2}$

$5^{\frac{-3}{x}} = 5^{-2} \Rightarrow \dfrac{-3}{x} = -2$

$-2x = -3$

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

**Cevap: E**

**5.** $5.4^{3-a} + \dfrac{2}{4^{a-3}} = 112$

$5.4^{3-a} + 2.4^{3-a} = 112$

$4^{3-a}.(5 + 2) = 112$

$4^{3-a}.7 = 112$

$4^{3-a} = 16$

$4^{3-a} = 4^{2}$

$3 - a = 2 \Rightarrow a = 1$ olur.

**Cevap: A**

**6.** $\dfrac{\boxed{8^{6}}}{\boxed{16^{2}}} = \dfrac{(8^{6})^{5}}{(16^{2})^{4}} = \dfrac{8^{30}}{16^{8}} = \dfrac{(2^{3})^{30}}{(2^{4})^{8}}$

$= \dfrac{2^{90}}{2^{32}}$

$= 2^{90-32}$

$= 2^{58}$

**Cevap: E**

**7.**
$$\begin{array}{rl} \bullet & 3^x - 5^y = 75 \\ & 5^y + 7^z = 349 \\ + & 7z - 3^x = 262 \\ \hline & 2.7^z = 686 \\ & 7^z = 343 \\ & z = 3 \end{array}$$

$\bullet \quad 7^z - 3^x = 262$

$343 - 3^x = 262$

$81 = 3^x$

$\Rightarrow \quad x = 4$

O halde $x.z = 4.3 = 12$ olur.

**Cevap: B**

**8.** $9^2 + 12^2 + 15^2$

$= 3^2(3^2 + 4^2 + 5^2)$

$= 3^2.x$

$= 9x$

**Cevap: D**

**9.** $\dfrac{4^3 + 4^3 + 4^3 + 4^3}{64^x} = 2$

$\dfrac{4.4^3}{4^{3x}} = 2$

$4^{4-3x} = 2$

$2^{8-6x} = 2^1$

$8 - 6x = 1$

$6x = 7$

$x = \dfrac{7}{6}$

**Cevap: E**

**10.**
$$\begin{array}{rl} & 2^x.3^y = 4 \\ x & 2^y.3^x = 9 \\ \hline & 2^{x+y}.3^{x+y} = 36 \end{array}$$

$6^{x+y} = 6^2 \quad \Rightarrow \quad x + y = 2$ olur.

**Cevap: C**

**11.** $\dfrac{3^{x+y} + 3^{x-y}}{3^y + 3^{-y}} = \dfrac{1}{27}$

$\dfrac{3^x(3^y + 3^{-y})}{3^y + 3^{-y}} = \dfrac{1}{3^3}$

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

$x = -3$

**Cevap: C**

**12.**
$$\begin{array}{rl} & 9^x + 9^y = 41 \\ + & 9^x - 9^y = 9 \\ \hline & 2.9^x = 50 \end{array}$$

$9^x = 25 \quad$ ve $\quad 3^x = 5$

$\rightarrow \quad 25 + 9^y = 41$

$9^y = 16 \quad$ ve $\quad 3^y = 4$

O halde $3^{x+y} = 3^x.3^y = 5.4 = 20$ olur.

**Cevap: D**

**13.** $\bullet \quad 2^{x-2} = 3 \quad \Rightarrow \quad 2^x.\dfrac{1}{4} = 3 \quad \Rightarrow \quad 2^x = 12$

$\bullet \quad 2^{1-x} = 2^1.\dfrac{1}{2^x} = \dfrac{2}{12} = \dfrac{1}{6}$ olur.

**Cevap: D**

**14.** $6^{x-1} = 3^{x+1}$

$6^x.\dfrac{1}{6} = 3^x.3$

$3^x.2^x.\dfrac{1}{6} = 3^x.3$

$2^x = 18$

$\Rightarrow \quad 2.2^x = 2.18$

$2^{x+1} = 36$ olur.

**Cevap: E**

**15.** $3^{a-4}.10^{a+b} = 30^{a+b}$

$3^{a-4}.10^{a+b} = 3^{a+b}.10^{a+b}$

$3^{a-4} = 3^{a+b}$

$\Rightarrow \quad a - 4 = a + b$

$b = -4$

**Cevap: A**