Q5

Answer :

$$\left\{\left(\frac{1}{3}\right)^{-3}-\left(\frac{1}{2}\right)^{-3}\right\}\div\left(\frac{1}{4}\right)^{-3}=\left\{3^3-2^3\right\}\div 4^3=\{27-8\}\div 64=\frac{19}{64}$$

Q6

Answer :

$$\left\{\left(\frac{4}{3}\right)^{-1}-\left(\frac{1}{4}\right)^{-1}\right\}^{-1}=\left\{\left(\frac{3}{4}\right)^{1}-\left(\frac{4}{1}\right)^{1}\right\}^{-1}=\left\{\left(\frac{3}{4}\right)-\left(\frac{4}{1}\right)\right\}^{-1}$$

The L.C.M. of 4 and 1 is 4.

$$\therefore\left\{\left(\frac{3\times1}{4\times1}\right)-\left(\frac{4\times4}{1\times4}\right)\right\}^{-1}$$

$$=\left\{\frac{3}{4}-\frac{16}{4}\right\}^{-1}=\left\{\frac{3-16}{4}\right\}^{-1}=\left\{\frac{-13}{4}\right\}^{-1}=\left\{\frac{4}{-13}\right\}^{1}=\frac{4}{-13}$$

$$=\frac{4\times-1}{-13\times-1}=\frac{-4}{13}$$

Q7

Answer :

$$\left[\left(5^{-1}\times3^{-1}\right)^{-1}\div6^{-1}\right]=\left[\left(\frac{1}{5}\times\frac{1}{3}\right)^{-1}\div\frac{1}{6}\right]=\left[\left(\frac{1}{15}\right)^{-1}\div\frac{1}{6}\right]=[15\times6]=90$$

Q8

Answer :

(i)

$$\left(2^0+3^{-1}\right)\times3^2=\left(1+\frac{1}{3}\right)\times3^2\ \left(\text{because } 2^0=1 \text{ and } 3^{-1}=\frac{1}{3}\right)$$

$$=\left(\frac{1\times3}{1\times3}+\frac{1\times1}{3\times1}\right)\times3^2=\left(\frac{3}{3}+\frac{1}{3}\right)\times3^2=\left(\frac{4}{3}\right)\times3^2=4\times3^{(2-1)}=4\times3=12$$

(ii)

$$\left(2^{-1}\times3^{-1}\right)\div2^{-3}=\left(\frac{1}{2}\times\frac{1}{3}\right)\div\left(\frac{1}{2}\right)^3$$

$$\left(\frac{1}{6}\right)\div\frac{1^3}{2^3}=\left(\frac{1}{6}\right)\div\left(\frac{1}{8}\right)=\frac{1}{6}\times8=\frac{8}{6}=\frac{4}{3}$$

(iii)

$$\left(\frac{1}{2}\right)^{-2}+\left(\frac{1}{3}\right)^{-2}+\left(\frac{1}{4}\right)^{-2}=\left(\frac{2}{1}\right)^2+\left(\frac{3}{1}\right)^2+\left(\frac{4}{1}\right)^2=2^2+3^2+4^2=4+9+16=29$$

Q9

Answer :

Consider the left side:

$$\left(\frac{5}{3}\right)^{-4} \times \left(\frac{5}{3}\right)^{-5} = \left(\frac{5}{3}\right)^{(-4+(-5))} = \left(\frac{5}{3}\right)^{-9}$$

Given:

$$\left(\frac{5}{3}\right)^{-9} = \left(\frac{5}{3}\right)^{3x}$$

Comparing the powers:

$$-9 = 3x \Rightarrow x = -3$$

Q10

Answer :

Given:

$$\left(\frac{4}{9}\right)^{4} \times \left(\frac{4}{9}\right)^{-7} = \left(\frac{4}{9}\right)^{2x-1}$$

$$\therefore \left(\frac{4}{9}\right)^{(4-7)} = \left(\frac{4}{9}\right)^{-3} = \left(\frac{4}{9}\right)^{2x-1}$$

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

Q11

Answer :

Let the required number be x.

$$\therefore x \times \left(-6\right)^{-1} = 9^{-1}$$

$$x \times \frac{1}{-6} = \frac{1}{9} \Rightarrow \frac{x}{-6} = \frac{1}{9}$$
$$\text{or } x = \frac{-6}{9}$$

********** END **********