Powers Ex 2.2 Q6

Answer :

$(i)\ \left(\frac{3}{4}\right)^{-2}$ ---> $(a^{-1} = 1/a)$

$= \left(\frac{4}{3}\right)^{2}$

$(ii)\ \left(\frac{5}{4}\right)^{-3}$ ---> $(a^{-1} = 1/a)$

$= \left(\frac{4}{5}\right)^{3}$

$(iii)\ 4^{3} \times 4^{-9}$ ---> $(a^{m} \times a^{n} = a^{m+n})$

$= 4^{(3-9)} = 4^{-6}$

$= \left(\frac{1}{4}\right)^{6}$

$$(iv)\ \left\{\left(\frac{4}{3}\right)^{-3}\right\}^{-4}$$ ---> $((a^m)^n = a^{mn})$

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

$$= \left(\frac{4}{3}\right)^{12}$$

$$(v)\ \left\{\left(\frac{3}{2}\right)^{4}\right\}^{-2}$$ ---> $((a^m)^n = a^{mn})$

$$= \left(\frac{3}{2}\right)^{4\times-2}$$

$$= \left(\frac{3}{2}\right)^{-8}$$

$$= \left(\frac{2}{3}\right)^{8}$$

Powers Ex 2.2 Q7

Answer :

$(i)\ \left(\left(\frac{1}{3}\right)^{-3} - \left(\frac{1}{2}\right)^{-3}\right) \div \left(\frac{1}{4}\right)^{-3} = \left(\frac{1}{(1/3)^3} - \frac{1}{(1/2)^3}\right) \div \frac{1}{(1/4)^3}$ ---> (a^{-n} = $1/(a^n)$)

$$= \left(\frac{1}{(1/27)} - \frac{1}{(1/8)}\right) \div \frac{1}{(1/64)}$$
$$= \left(\frac{27}{1} - \frac{8}{1}\right) \div 64$$
$$= (19) \times \frac{1}{64}$$
$$= \frac{19}{64}$$

$(ii)\ (3^2 - 2^2) \times \left(\frac{2}{3}\right)^{-3} = (9-4) \times \frac{1}{(2/3)^3}$ ---> ($a^{-n} = 1/(a^n)$)

$$= 5 \times \frac{1}{8/27}$$
$$= 5 \times \frac{27}{8}$$
$$= \frac{135}{8}$$

$$(iii)\left(\left(\frac{1}{2}\right)^{-1}\times(-4)^{-1}\right)^{-1}=\left(\left(\frac{1}{1/2}\right)\times\left(\frac{1}{-4}\right)\right)^{-1}$$ ---> ($a^{-1} = 1/a$)

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

$$=\left(\frac{1}{-2}\right)^{-1}$$

$$=\frac{1}{1/(-2)}$$ ---> ($a^{-1} = 1/a$)

=-2

$$(iv)\left(\left(\left(\frac{-1}{4}\right)^{2}\right)^{-2}\right)^{-1}=\left(\left(\frac{(-1)^2}{4^2}\right)^{-2}\right)^{-1}$$ --> ($(a/b)^n = a^n/(b^n)$)

$$=\left(\left(\frac{1}{16}\right)^{-2}\right)^{-1}$$ ---> ($a^{-n} = 1/(a^n)$)

$$=\left(\left(\frac{1}{(1/16)^2}\right)\right)^{-1}$$

$$=\left(\frac{1}{(1/256)}\right)^{-1}$$

$$=256^{-1}$$ ---> ($a^{-1} = 1/a$)

$$=\frac{1}{256}$$

$$(v)\left(\left(\frac{2}{3}\right)^{2}\right)^{3}\times\left(\frac{1}{3}\right)^{-4}\times3^{-1}\times6^{-1}=\left(\frac{2^2}{3^2}\right)^{3}\times\frac{1}{(1/3)^4}\times\frac{1}{3}\times\frac{1}{6}$$ ---> ($(a/b)^n = a^n/(b^n)$) and ($a^{-n} = 1/(a^n)$)

$$=\left(\frac{4}{9}\right)^{3}\times\frac{1}{(1/81)}\times\frac{1}{3}\times\frac{1}{6}$$

$$=\frac{4^3}{9^3}\times81\times\frac{1}{18}$$ ---> ($(a/b)^n = a^n/(b^n)$)

$$=\frac{64}{729}\times81\times\frac{1}{18}$$

$$=\frac{64}{9}\times\frac{1}{18}$$

$$=64\times\frac{1}{162}$$

$$=\frac{64}{162}$$

$$=\frac{32}{81}$$

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