



Exercise 5A

Q1

Answer :

$$(i) \frac{5}{7} \times \frac{5}{7} \times \frac{5}{7} \times \frac{5}{7} = \left(\frac{5}{7}\right)^4$$

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

$$(iii) \left(\frac{-1}{6}\right) \times \left(\frac{-1}{6}\right) \times \left(\frac{-1}{6}\right) = \left(\frac{-1}{6}\right)^3$$

$$(iv) (-8) \times (-8) \times (-8) \times (-8) \times (-8) = (-8)^5$$

Q2

Answer :

$$(i) \frac{25}{36} = \frac{5^2}{6^2} \quad [\text{since } 25 = 5^2 \text{ and } 36 = 6^2]$$
$$= \left(\frac{5}{6}\right)^2$$

$$(ii) \frac{-27}{64} = \frac{(-3)^3}{4^3} \quad [\text{since } -27 = (-3)^3 \text{ and } 64 = 4^3]$$
$$= \left(\frac{-3}{4}\right)^3$$

$$(iii) \frac{-32}{243} = \frac{(-2)^5}{3^5} \quad [\text{since } -32 = (-2)^5 \text{ and } 243 = 3^5]$$
$$= \left(\frac{-2}{3}\right)^5$$

$$(iv) \frac{-1}{128} = \frac{(-1)^7}{2^7} \quad [\text{since } (-1)^7 = -1 \text{ and } 128 = 2^7]$$
$$= \left(\frac{-1}{2}\right)^7$$

Q3

Answer :

$$(i) \left(\frac{2}{3}\right)^5 = \frac{(2)^5}{(3)^5} = \frac{2 \times 2 \times 2 \times 2 \times 2}{3 \times 3 \times 3 \times 3 \times 3} = \frac{32}{243}$$

$$(ii) \left(\frac{-8}{5}\right)^3 = \frac{(-8)^3}{(5)^3} = \frac{(-8) \times (-8) \times (-8)}{5 \times 5 \times 5} = \frac{-512}{125}$$

$$(iii) \left(\frac{-13}{11}\right)^2 = \frac{(-13)^2}{(11)^2} = \frac{(-13) \times (-13)}{11 \times 11} = \frac{169}{121}$$

$$(iv) \left(\frac{1}{6}\right)^3 = \frac{(1)^3}{(6)^3} = \frac{1 \times 1 \times 1}{6 \times 6 \times 6} = \frac{1}{216}$$

$$(v) \left(\frac{-1}{2}\right)^5 = \frac{(-1)^5}{(2)^5} = \frac{(-1) \times (-1) \times (-1) \times (-1) \times (-1)}{2 \times 2 \times 2 \times 2 \times 2} = \frac{-1}{32}$$

$$(vi) \left(\frac{-3}{2}\right)^4 = \frac{(-3)^4}{(2)^4} = \frac{(-3) \times (-3) \times (-3) \times (-3)}{2 \times 2 \times 2 \times 2} = \frac{81}{16}$$

$$(vii) \left(\frac{-4}{7}\right)^3 = \frac{(-4)^3}{(7)^3} = \frac{(-4) \times (-4) \times (-4)}{7 \times 7 \times 7} = \frac{-64}{343}$$

$$(viii) (-1)^9 = -1 \quad [\text{Since } (-1)^{\text{an odd natural number}} = -1]$$

Q4

Answer :

$$(i) (4)^{-1} = \left(\frac{4}{1}\right)^{-1} = \left(\frac{1}{4}\right)^1 = \frac{1}{4} \quad \left[\text{since } \left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n\right]$$

$$(ii) (-6)^{-1} = \left(\frac{-6}{1}\right)^{-1} = \left(\frac{1}{-6}\right)^1 = \frac{-1}{6} \quad \left[\text{since } \left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n\right]$$

$$(iii) \left(\frac{1}{3}\right)^{-1} = \left(\frac{3}{1}\right)^1 = \frac{3}{1} \quad \left[\text{since } \left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n\right]$$

$$(iv) \left(\frac{-2}{3}\right)^{-1} = \left(\frac{3}{-2}\right)^1 = \frac{-3}{2} \quad \left[\text{since } \left(\frac{a}{b}\right)^{-n} = \left(\frac{b}{a}\right)^n\right]$$

Q5

Answer :

We know that the reciprocal of $\left(\frac{a}{b}\right)^m$ is $\left(\frac{b}{a}\right)^m$.

$$(i) \text{ Reciprocal of } \left(\frac{3}{8}\right)^4 = \left(\frac{8}{3}\right)^4$$

$$(ii) \text{ Reciprocal of } \left(\frac{-5}{6}\right)^{11} = \left(\frac{-6}{5}\right)^{11}$$

$$(iii) \text{ Reciprocal of } 6^7 = \text{Reciprocal of } \left(\frac{6}{1}\right)^7 = \left(\frac{1}{6}\right)^7$$

$$(iv) \text{ Reciprocal of } (-4)^3 = \text{Reciprocal of } \left(\frac{-4}{1}\right)^3 = \left(\frac{-1}{4}\right)^3$$

Q6

Answer :

(i) $8^0 = 1$

(ii) $(-3)^0 = 1$

(iii) $4^0 + 5^0 = 1 + 1 = 2$

(iv) $6^0 \times 7^0 = 1 \times 1 = 1$

Note: $a^0 = 1$

Q7

Answer :

(i) $\left(\frac{3}{2}\right)^4 \times \left(\frac{1}{5}\right)^2 = \frac{3^4}{2^4} \times \frac{1^2}{5^2} = \frac{81 \times 1}{16 \times 25} = \frac{81}{400}$

(ii) $\left(\frac{-2}{3}\right)^5 \times \left(\frac{-3}{7}\right)^3 = \frac{(-2)^5}{(3)^5} \times \frac{(-3)^3}{(7)^3}$
 $= \frac{(-2)^5}{(7)^3} \times \frac{(-1)(3)^3}{(3)^5} \quad \left[\text{since } 3^{-2} = \frac{1}{9} \right]$
 $= \frac{-32 \times -1 \times 3^{3-5}}{343}$
 $= \frac{-32 \times -1 \times 3^{-2}}{343}$
 $= \frac{-32 \times -1 \times 1}{343 \times 9}$
 $= \frac{32}{3087}$

(iii) $\left(\frac{-1}{2}\right)^5 \times 2^3 \times \left(\frac{3}{4}\right)^2 = \frac{(-1)^5}{2^5} \times 2^3 \times \frac{3^2}{4^2}$
 $= \frac{(-1)^5}{2^5} \times 2^3 \times \frac{3^2}{(2^2)^2}$
 $= \frac{-1 \times 2^3 \times 3^2}{2^5 \times 2^4}$
 $= \frac{-1 \times 2^3 \times 3^2}{2^9} = -1 \times 2^{3-9} \times 3^2 = -9 \times 2^{-6} = \frac{-9}{2^6} = \frac{-9}{64}$
 $\left[\text{since } \left(\frac{a}{b}\right)^{-1} = \left(\frac{b}{a}\right)^1 \right]$

(iv) $\left(\frac{2}{3}\right)^2 \times \left(\frac{-3}{5}\right)^3 \times \left(\frac{7}{2}\right)^2 = \frac{2^2}{3^2} \times \frac{(-3)^3}{5^3} \times \frac{7^2}{2^2}$
 $= \frac{-1 \times 3^{3-2} \times 7^2}{5^3} = \frac{-1 \times 3^1 \times 7^2}{5^3} = \frac{-1 \times 3 \times 49}{125} = \frac{-147}{125}$

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