Algebraic Expressions and Identities Ex 6.3 Q28

Answer :

To multiply algebraic expressions, we use commutative and associative laws along with the laws of indices, i.e., $a^m \times a^n = a^{m+n}$.

We have:

$$\left(\tfrac{1}{8}\, x^2 y^4\right) \times \left(\tfrac{1}{4}\, x^4 y^2\right) \times (xy) \times 5$$
$$= \left(\tfrac{1}{8} \times \tfrac{1}{4} \times 5\right) \times \left(x^2 \times x^4 \times x\right) \times \left(y^4 \times y^2 \times y\right)$$
$$= \left(\tfrac{1}{8} \times \tfrac{1}{4} \times 5\right) \times \left(x^{2+4+1}\right) \times \left(y^{4+2+1}\right)$$
$$= \tfrac{5}{32}\, x^7 y^7$$

To verify the result, we substitute $x = 1$ and $y = 2$ in LHS; we get:

$$\text{LHS} = \left(\tfrac{1}{8}\, x^2 y^4\right) \times \left(\tfrac{1}{4}\, x^4 y^2\right) \times (xy) \times 5$$
$$= \left\{\tfrac{1}{8} \times (1)^2 \times (2)^4\right\} \times \left\{\tfrac{1}{4} \times (1)^4 \times (2)^2\right\} \times (1 \times 2) \times 5$$
$$= \left(\tfrac{1}{8} \times 1 \times 16\right) \times \left(\tfrac{1}{4} \times 1 \times 4\right) \times (1 \times 2) \times 5$$
$$= 2 \times 1 \times 2 \times 5$$
$$= 20$$

Substituting $x = 1$ and $y = 2$ in RHS, we get:

$$\text{RHS} = \frac{5}{32}\, x^7 y^7$$
$$= \frac{5}{32} (1)^7 (2)^7$$
$$= \frac{5}{\cancel{32}} \times 1 \times \cancel{128}^{\,4}$$
$$= 20$$

Because LHS is equal to RHS, the result is correct.

Thus, the answer is $\frac{5}{32}\, x^7 y^7$.

Algebraic Expressions and Identities Ex 6.3 Q29

Answer :

To multiply algebraic expressions, we use commutative and associative laws along with the laws of indices, i.e., $a^m \times a^n = a^{m+n}$.

We have:

$$\left(\tfrac{2}{5}\, a^2 b\right) \times \left(-15 b^2\, ac\right) \times \left(-\tfrac{1}{2}\, c^2\right)$$

$$= \left\{\tfrac{2}{5} \times (-15) \times \left(-\tfrac{1}{2}\right)\right\} \times \left(a^2 \times a\right) \times \left(b \times b^2\right) \times \left(c \times c^2\right)$$

$$= \left\{\tfrac{2}{5} \times (-15) \times \left(-\tfrac{1}{2}\right)\right\} \times \left(a^{2+1}\right) \times \left(b^{1+2}\right) \times \left(c^{1+2}\right)$$

$$= 3 a^3 b^3 c^3$$

$\because$ The expression doesn't consist of the variables x and y.

$\therefore$ The result cannot be verified for $x = 1$ and $y = 2$

Thus, the answer is $3 a^3 b^3 c^3$.

Algebraic Expressions and Identities Ex 6.3 Q30

Answer :

To multiply algebraic expressions, we use commutative and associative laws along with the laws of indices, i.e., $a^m \times a^n = a^{m+n}$.

We have:

$$\left(-\tfrac{4}{7}\, a^2 b\right) \times \left(-\tfrac{2}{3}\, b^2 c\right) \times \left(-\tfrac{7}{6}\, c^2 a\right)$$

$$= \left\{\left(-\tfrac{4}{7}\right) \times \left(-\tfrac{2}{3}\right) \times \left(-\tfrac{7}{6}\right)\right\} \times \left(a^2 \times a\right) \times \left(b \times b^2\right) \times \left(c \times c^2\right)$$

$$= \left\{\left(-\tfrac{4}{7}\right) \times \left(-\tfrac{2}{3}\right) \times \left(-\tfrac{7}{6}\right)\right\} \times \left(a^{2+1}\right) \times \left(b^{1+2}\right) \times \left(c^{1+2}\right)$$

$$= -\tfrac{4}{9}\, a^3 b^3 c^3$$

$\because$ The expression doesn't consist of the variables x and y.

$\therefore$ The result cannot be verified for $x = 1$ and $y = 2$.

Thus, the answer is $-\tfrac{4}{9}\, a^3 b^3 c^3$.