

Algebraic Expressions and Identities Ex 6.5 Q19 **Answer:**

To multiply, we will use distributive law as follows:

$$\left(\frac{1}{3}x - \frac{\mathbf{y}^2}{5}\right) \left(\frac{1}{3}x + \frac{\mathbf{y}^2}{5}\right)
= \left[\frac{1}{3}x \left(\frac{1}{3}x + \frac{\mathbf{y}^2}{5}\right)\right] - \left[\frac{\mathbf{y}^2}{5} \left(\frac{1}{3}x + \frac{\mathbf{y}^2}{5}\right)\right]
= \left[\frac{1}{9}x^2 + \frac{x\mathbf{y}^2}{15}\right] - \left[\frac{x\mathbf{y}^2}{15} + \frac{\mathbf{y}^4}{25}\right]
= \frac{1}{9}x^2 + \frac{x\mathbf{y}^2}{15} - \frac{x\mathbf{y}^2}{15} - \frac{\mathbf{y}^4}{25}
= \frac{1}{9}x^2 - \frac{\mathbf{y}^4}{25}$$

$$\therefore \left(\frac{1}{3} x - \frac{\mathbf{v}^2}{5}\right) \left(\frac{1}{3} x + \frac{\mathbf{v}^2}{5}\right) = \frac{1}{9} x^2 - \frac{\mathbf{v}^4}{25}$$

Now, we will put x = -1 and y = -2 on both the sides to verify the result.

LHS =
$$\left(\frac{1}{3}x - \frac{\mathbf{v}^2}{5}\right)\left(\frac{1}{3}x + \frac{\mathbf{v}^2}{5}\right)$$

= $\left[\frac{1}{3}(-1) - \frac{(-2)^2}{5}\right]\left[\frac{1}{3}(-1) + \frac{(-2)^2}{5}\right]$
= $\left(-\frac{1}{3} - \frac{4}{5}\right)\left(-\frac{1}{3} + \frac{4}{5}\right)$
= $\left(\frac{-17}{15}\right)\left(\frac{7}{15}\right)$
= $\frac{-119}{225}$

RHS =
$$\frac{1}{9} x^2 - \frac{y^4}{25}$$

= $\frac{1}{9} (-1)^2 - \frac{(-2)^4}{25}$
= $\frac{1}{9} \times 1 - \frac{16}{25}$
= $\frac{1}{9} - \frac{16}{25}$
= $-\frac{119}{225}$

Because LHS is equal to RHS, the result is verified

Thus, the answer is $\frac{1}{9}$ $x^2 - \frac{ extbf{y}^4}{25}$

Algebraic Expressions

and Identities Ex 6.5 Q20

Answer:

To simplify, we will proceed as follows:

$$x^{2}(x + 2y)(x - 3y)$$

$$= [x^{2}(x + 2y)](x - 3y)$$

$$= (x^{3} + 2x^{2}y)(x - 3y)$$

$$= x^{3}(x - 3y) + 2x^{2}y(x - 3y)$$

$$= x^{4} - 3x^{3}y + 2x^{3}y - 6x^{2}y^{2}$$

$$= x^{4} - x^{3}y - 6x^{2}y^{2}$$

Thus, the answer is $x^4 - x^3y - 6x^2y^2$.

Algebraic Expressions and Identities Ex 6.5 Q21

Answer:

To simplify, we will proceed as follows:

$$(x^{2} - 2y^{2})(x + 4y)x^{2}y^{2}$$

$$= [x^{2}(x + 4y) - 2y^{2}(x + 4y)]x^{2}y^{2}$$

$$= (x^{3} + 4x^{2}y - 2xy^{2} - 8y^{3})x^{2}y^{2}$$

$$= x^{5}y^{2} + 4x^{4}y^{3} - 2x^{3}y^{4} - 8x^{2}y^{5}$$

Thus, the answer is $x^5y^2+4x^4y^3-2x^3y^4-8x^2y^5$.

Algebraic Expressions and Identities Ex 6.5 Q22

Answer:

To simplify, we will proceed as follows:

$$a^{2}b^{2}(a+2b)(3a+b)$$

$$= \left[a^{2}b^{2}(a+2b)\right](3a+b)$$

$$= \left(a^{3}b^{2} + 2a^{2}b^{3}\right)(3a+b)$$

$$= 3a\left(a^{3}b^{2} + 2a^{2}b^{3}\right) + b\left(a^{3}b^{2} + 2a^{2}b^{3}\right)$$

$$= 3a^{4}b^{2} + 6a^{3}b^{3} + a^{3}b^{3} + 2a^{2}b^{4}$$

$$= 3a^{4}b^{2} + 7a^{3}b^{3} + 2a^{2}b^{4}$$

Thus, the answer is $3a^4b^2 + 7a^3b^3 + 2a^2b^4$.

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