Algebraic Expressions and Identities Ex 6.6 Q19

$\left(\text{iii}\right)\ (7m-8n)^2+(7m+8n)^2$

$=2(7m)^2+2(8n)^2 \qquad \left[\because (a-b)^2+(a+b)^2=2a^2+2b^2\right]$

$=98m^2+128n^2$

$\left(\text{iv}\right)\ (2.5p-1.5q)^2-(1.5p-2.5q)^2$

$=(2.5p)^2+(1.5q)^2-2(2.5p)(1.5q)-\left[(1.5p)^2+(2.5q)^2-2(1.5p)(2.5q)\right]$

$=(2.5p)^2+(1.5q)^2\ \cancel{-2(2.5p)(1.5q)}-(1.5p)^2-(2.5q)^2+\cancel{2(1.5p)(2.5q)}$

$=(2.5p)^2-(1.5p)^2+(1.5q)^2-(2.5q)^2$

$=[(2.5p+1.5p)(2.5p-1.5p)]+[(1.5q+2.5)(1.5q-2.5q)]$

$\left[\because (a+b)(a-b)=a^2-b^2\right]$

$=4p\times p+4q\times(-q)$

$=4p^2-4q^2$

$=4(p^2-4q^2\ )$

$\text{v})\ \left(m^2-n^2m\right)^2+2m^3n^2$

$=\left(m^2\right)^2+\left(n^2m\right)^2 \qquad \left[\because\ (a-b)^2+2ab=a^2+b^2\right]$

$=m^4+n^4m^2$

Algebraic Expressions and Identities Ex 6.6 Q20

Answer :

$(\text{i})\ \text{LHS}=(3x+7)^2-84x$

$=(3x+7)^2-4\times 3x\times 7$

$=(3x-7)^2 \qquad \left[\because\ (a+b)^2-4ab=(a-b)^2\right]$

$=\text{RHS}$

Because LHS is equal to RHS, the given equation is verified.

$(\text{ii})\ \text{LHS}=(9a-5b)^2+180ab$

$=(9a-5b)^2+4\times 9a\times 5b$

$=(9a+5b)^2 \qquad \left[\because\ (a-b)^2+4ab=(a+b)^2\right]$

$=\text{RHS}$

Because LHS is equal to RHS, the given equation is verified.

$(\text{iii})\ \text{LHS}=\left(\frac{4m}{3}-\frac{3n}{4}\right)^2+2mn$

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

$=\left(\frac{4m}{3}\right)^2+\left(\frac{3n}{4}\right)^2 \qquad \left[\because\ (a-b)^2+2ab=a^2+b^2\right]$

$= \frac{16m^2}{9} + \frac{9n^2}{16}$
$= \text{RHS}$
Because LHS is equal to RHS, the given equation is verified.

(iv) LHS
$= (4pq + 3q)^2 - (4pq - 3q)^2$
$= 4(4pq)(3q)$ $\left[\because (a+b)^2 - (a+b)^2 = 4ab\right]$
$= 48pq^2$
$= \text{RHS}$
Because LHS is equal to RHS, the given equation is verified.

(v) LHS $= (a-b)(a+b) + (b-c)(b+c) + (c+a)(c-a)$
$= a^2 - b^2 + b^2 - c^2 + c^2 - a^2$ $\left[\because (a+b)(a-b) = a^2 - b^2\right]$
$= \cancel{a^2} - \cancel{b^2} + \cancel{b^2} - \cancel{c^2} + \cancel{c^2} - \cancel{a^2}$
$= 0$
$= \text{RHS}$
Because LHS is equal to RHS, the given equation is verified.

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