Algebraic Expressions and Identities Ex 6.7 Q1

Answer :

(i) Here, we will use the identity $(x+a)(x+b)=x^2+(a+b)x+ab$.

$(x+4)(x+7)$

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

$=x^2+11x+28$

(ii) Here, we will use the identity $(x-a)(x+b)=x^2+(b-a)x-ab$.

$(x-11)(x+4)$

$=x^2+(4-11)x-11\times 4$

$=x^2-7x-44$

(iii) Here, we will use the identity $(x+a)(x-b)=x^2+(a-b)x-ab$.

$(x+7)(x-5)$

$=x^2+(7-5)x-7\times 5$

$=x^2+2x-35$

(iv) Here, we will use the identity $(x-a)(x-b)=x^2-(a+b)x+ab$.

$(x-3)(x-2)$

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

$=x^2-5x+6$

(v) Here, we will use the identity $(x-a)(x-b)=x^2-(a+b)x+ab$.

$\left(y^2-4\right)\left(y^2-3\right)$

$=\left(y^2\right)^2-(4+3)\left(y^2\right)+4\times 3$

$=y^4-7y^2+12$

(vi) Here, we will use the identity $(x+a)(x+b)=x^2+(a+b)x+ab$.

$\left(x+\frac{4}{3}\right)\left(x+\frac{3}{4}\right)$

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

$=x^2+\frac{25}{12}x+1$

(vii) Here, we will use the identity $(x+a)(x+b)=x^2+(a+b)x+ab$.

$(3x+5)(3x+11)$

$=(3x)^2+(5+11)(3x)+5\times 11$

$=9x^2+48x+55$

(viii) Here, we will use the identity $(x-a)(x+b)=x^2+(b-a)x-ab$.

$\left(2x^2-3\right)\left(2x^2+5\right)$

$=\left(2x^2\right)^2+(5-3)\left(2x^2\right)-3\times 5$

$=4x^4+4x^2-15$

(ix) Here, we will use the identity $(x+a)(x-b)=x^2+(a-b)x-ab$.

$\left(z^2+2\right)\left(z^2-3\right)$

$=\left(z^2\right)^2+(2-3)\left(z^2\right)-2\times 3$

$=z^4-z^2-6$

(x) Here, we will use the identity $(x-a)(x-b)=x^2-(a+b)x+ab$.

$(3x-4y)(2x-4y)$

$=(4y-3x)(4y-2x)$ $\quad\left(\text{Taking common } -1 \text{ from both parentheses}\right)$

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

$=16y^2-(12xy+8xy)+6x^2$

$=16y^2-20xy+6x^2$

(xi) Here, we will use the identity $(x-a)(x-b)=x^2-(a+b)x+ab$.

$\left(3x^2-4xy\right)\left(3x^2-3xy\right)$

$=\left(3x^2\right)^2-(4xy+3xy)\left(3x^2\right)+4xy\times 3xy$

$=9x^4-\left(12x^3y+9x^3y\right)+12x^2y^2$

$=9x^4-21x^3y+12x^2y^2$

(xii) Here, we will use the identity $(x+a)(x+b)=x^2+(a+b)x+ab$.

$\left(x+\frac{1}{5}\right)(x+5)$

$=x^2+\left(\frac{1}{5}+5\right)x+\frac{1}{5}\times 5$

$=x^2+\frac{26}{5}x+1$

(xiii) Here, we will use the identity $(x+a)(x+b)=x^2+(a+b)x+ab$.

$\left(z+\frac{3}{4}\right)\left(z+\frac{4}{3}\right)$

$=z^2+\left(\frac{3}{4}+\frac{4}{3}\right)x+\frac{3}{4}\times\frac{4}{3}$

$=z^2+\frac{25}{12}z+1$

(xiv) Here, we will use the identity $(x+a)(x+b)=x^2+(a+b)x+ab$.

$\left(x^2+4\right)\left(x^2+9\right)$

$=\left(x^2\right)^2+(4+9)\left(x^2\right)+4\times 9$

$=x^4+13x^2+36$

(xv) Here, we will use the identity $(x+a)(x+b)=x^2+(a+b)x+ab$.

$\left(y^2+12\right)\left(y^2+6\right)$

$=\left(y^2\right)^2+(12+6)\left(y^2\right)+12\times 6$

$=y^4+18y^2+72$

(xvi) Here, we will use the identity $(x+a)(x-b)=x^2+(a-b)x-ab$.

$\left(y^2+\frac{5}{7}\right)\left(y^2-\frac{14}{5}\right)$

$=\left(y^2\right)^2+\left(\frac{5}{7}-\frac{14}{5}\right)\left(y^2\right)-\frac{5}{7}\times\frac{14}{5}$

$=y^4-\frac{73}{35}y^2-2$

(xvii) Here, we will use the identity $(x+a)(x-b)=x^2+(a-b)x-ab$.

$\left(p^2+16\right)\left(p^2-\frac{1}{4}\right)$

$=\left(p^2\right)^2+\left(16-\frac{1}{4}\right)\left(p^2\right)-16\times\frac{1}{4}$

$=p^4+\frac{63}{4}p^2-4$

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