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 $(x-a)(x-b)=x^2-(a+b)x+ab$.

$$(y^2-4)(y^2-3)$$
$$=(y^2)^2-(4+3)(y^2)+4\times 3$$
$$=y^4-7y^2+12$$

(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 $(x-a)(x+b)=x^2+(b-a)x-ab$.

$$(2x^2-3)(2x^2+5)$$
$$=(2x^2)^2+(5-3)(2x^2)-3\times 5$$
$$=4x^4+4x^2-15$$

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

$(z^2+2)(z^2-3)$

$=(z^2)^2+(2-3)(z^2)-2\times3$

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

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

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

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

$=(4y)^2-(3x+2x)(4y)+3x\times2x$

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

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

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

$(3x^2-4xy)(3x^2-3xy)$

$=(3x^2)^2-(4xy+3xy)(3x^2)+4xy\times3xy$

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

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

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

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

$=x^2+\left(\frac{1}{5}+5\right)x+\frac{1}{5}\times5$

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

(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 $(x+a)(x+b)=x^2+(a+b)x+ab$.

$(x^2+4)(x^2+9)$

$=(x^2)^2+(4+9)(x^2)+4\times9$

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

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

$(y^2+12)(y^2+6)$

$=(y^2)^2+(12+6)(y^2)+12\times6$

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

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

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

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

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

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

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

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

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

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