Operations On Algebraic Expressions
Ex 6B

Q1

Answer :

By horizontal method:

$$(5x+7)\times(3x+4)$$
$$=5x(3x+4)+7(3x+4)$$
$$=15x^2+20x+21x+28$$
$$=15x^2+41x+28$$

Q2

Answer :

By horizontal method:

$$(4x+9)\times(x-6)$$
$$=4x(x-6)+9(x-6)$$
$$=4x^2-24x+9x-54$$
$$=4x^2-15x-54$$

Q3

Answer :

By horizontal method:

$$(2x+5)\times(4x-3)$$
$$=2x(4x-3)+5(4x-3)$$
$$=8x^2-6x+20x-15$$
$$=8x^2+14x-15$$

Q4

Answer :

By horizontal method:

$$(3y-8)\times(5y-1)$$
$$=3y(5y-1)-8(5y-1)$$
$$=15y^2-3y-40y+8$$
$$=15y^2-43y+8$$

Q5

Answer :

By horizontal method:

$$(7x+2y)\times(x+4y)$$
$$=7x(x+4y)+2y(x+4y)$$
$$=7x^2+28xy+2xy+8y^2$$
$$=7x^2+30xy+8y^2$$

Q6

Answer :

By horizontal method:

$$(9x+5y)\times(4x+3y)$$
$$9x(4x+3y)+5y(4x+3y)$$
$$=36x^2+27xy+20xy+15y^2$$
$$=36x^2+47xy+15y^2$$

Q7

Answer :

By horizontal method:

$$(3m-4n)\times(2m-3n)$$
$$=3m(2m-3n)-4n(2m-3n)$$
$$=6m^2-9mn-8mn+12n^2$$
$$=6m^2-17mn+12n^2$$

Q8

Answer :

By horizontal method:

$$(x^2-a^2)\times(x-a)$$
$$=x^2(x-a)-a^2(x-a)$$
$$=x^3-ax^2-a^2x+a^3$$
i.e $(x^3+a^3)-ax(x-a)$

Q9

Answer :

By horizontal method:

$$(x^2-y^2)\times(x+2y)$$
$$=x^2(x+2y)-y^2(x+2y)$$
$$=x^3+2x^2y-xy^2-2y^3$$
$$i.e(x^3-2y^3)+xy(2x-y)$$

Q10

Answer :

By horizontal method:

$$(3p^2+q^2)\times(2p^2-3q^2)$$
$$=3p^2(2p^2-3q^2)+q^2(2p^2-3q^2)$$
$$=6p^4-9p^2q^2+2p^2q^2-3q^4$$
$$i.e 6p^4-7p^2q^2-3q^4$$

Q11

Answer :

By horizontal method:

$$(2x^2-5y^2)\times(x^2+3y^2)$$
$$=2x^2(x^2+3y^2)-5y^2(x^2+3y^2)$$
$$=2x^4+6x^2y^2-5x^2y^2-15y^4$$
$$=2x^4+x^2y^2-15y^4$$

Q12

Answer :

By horizontal method:

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

Q13

Answer :

By horizontal method:

$$(x^4+y^4)\times(x^2-y^2)$$
$$=x^4(x^2-y^2)+y^4(x^2-y^2)$$
$$=x^6-x^4y^2+y^4x^2-y^6$$
$$=(x^6-y^6)-x^2y^2(x^2-y^2)$$

Q14

Answer :

By horizontal method:

$$\left(x^4+\frac{1}{x^4}\right)\times\left(x+\tfrac{1}{x}\right)$$
$$=x^4\left(x+\tfrac{1}{x}\right)+\tfrac{1}{x^4}\left(x+\tfrac{1}{x}\right)$$
$$=x^5+x^3+\tfrac{1}{x^3}+\tfrac{1}{x^5}$$
$$i.e\ x^3\left(x^2+1\right)+\tfrac{1}{x^3}\left(1+\frac{1}{x^2}\right)$$

Q15

Answer :

By horizontal method:

$$(x^2-3x+7)\times(2x+3)$$
$$=2x(x^2-3x+7)+3(x^2-3x+7)$$
$$=2x^3-6x^2+14x+3x^2-9x+21$$
$$=2x^3-3x^2+5x+21$$

Q16

Answer :

By horizontal method:

$$(3x^2+5x-9)\times(3x-5)$$
$$=3x(3x^2+5x-9)-5(3x^2+5x-9)$$
$$=9x^3+15x^2-27x-15x^2-25x+45$$
$$=9x^3-52x+45$$

Q17

Answer :

By horizontal method:

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

Q18

Answer :

By horizontal method:

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

Q19

Answer :

By horizontal method:

$$(x^3-2x^2+5)\times(4x-1)$$
$$=4x(x^3-2x^2+5)-1(x^3-2x^2+5)$$
$$=4x^4-8x^3+20x-x^3+2x^2-5$$
$$=4x^4-9x^3+2x^2+20x-5$$

Q20

Answer :

By horizontal method:

$$(9x^2-x+15)\times(x^2-3)$$
$$=x^2(9x^2-x+15)-3(9x^2-x+15)$$
$$=9x^4-x^3+15x^2-27x^2+3x-45$$
$$=9x^4-x^3-12x^2+3x-45$$

Q21

Answer :

By horizontal method:

$$(x^2-5x+8)\times(x^2+2)$$
$$=x^2(x^2-5x+8)+2(x^2-5x+8)$$
$$=x^4-5x^3+8x^2+2x^2-10x+16$$
$$=x^4-5x^3+10x^2-10x+16$$

Q22

Answer :

By horizontal method:

$$(x^3-5x^2+3x+1)\times(x^2-3)$$
$$=x^2(x^3-5x^2+3x+1)-3(x^3-5x^2+3x+1)$$
$$=x^5-5x^4+3x^3+x^2-3x^3+15x^2-9x-3$$
$$=x^5-5x^4+16x^2-9x-3$$

Q23

Answer :

By horizontal method:

$$(3x+2y-4)\times(x-y+2)$$
$$x(3x+2y-4)-y(3x+2y-4)+2(3x+2y-4)$$
$$=3x^2+2xy-4x-3xy-2y^2+4y+6x+4y-8$$
$$=3x^2-2y^2-xy+2x+8y-8$$

Q24

Answer :

By horizontal method:

$$(x^2-5x+8)\times(x^2+2x-3)$$
$$=x^2(x^2-5x+8)+2x(x^2-5x+8)-3(x^2-5x+8)$$
$$=x^4-5x^3+8x^2+2x^3-10x^2+16x-3x^2+15x-24$$
$$=x^4-3x^3-5x^2+31x-24$$

Q25

Answer :

By horizontal method:

$$(2x^2+3x-7)\times(3x^2-5x+4)$$
$$=2x^2(3x^2-5x+4)+3x(3x^2-5x+4)-7(3x^2-5x+4)$$
$$=6x^4-10x^3+8x^2+9x^3-15x^2+12x-21x^2+35x-28$$
$$=6x^4-x^3-28x^2+47x-28$$

Q26

Answer :

By horizontal method:

$$(9x^2-x+15)\times(x^2-x-1)$$
$$=x^2(9x^2-x+15)-x(9x^2-x+15)-1(9x^2-x+15)$$
$$=9x^4-x^3+15x^2-9x^3+x^2-15x-9x^2+x-15$$
$$=9x^4-10x^3+7x^2-14x-15$$