

Expand :-

$$\begin{aligned} \text{Q. } (2p+q+5)^2 &= a^2+b^2+c^2+2pqab+2bc+2ca \\ &= (2p)^2 + (q)^2 + (5)^2 + [2 \times 2p \times q] + [2 \times q \times 5] + \\ &\quad (2 \times 5 \times 2p) \\ &= 4p^2 + q^2 + 25 + 4pq + 10q + 20p. \end{aligned}$$

$$= m^2 + (2n)^2 + (3x)^2 + [2 \times m \times 2n] + [2 \times 2n \times 3x] + [2 \times 2n \times 3x]$$

$$= m^2 + 4n^2 + 9x^2 + 4mn + 12nx + 6xm$$

$$3) (3x + 4y - 5p)^2$$

$$= (3x)^2 + (4y)^2 + (5p)^2 + [2 \times 3x \times 4y] + [2 \times 4y \times 5p] + [2 \times 3x \times 5p]$$

$$= 9x^2 + 16y^2 + 25p^2 + 24xy + 40py + 30px$$

$$4) (7m - 3n - 4k)^2$$

$$= (7m)^2 + (-3n)^2 + (-4k)^2 + 2(7m)(-3n) + 2(-3n)(-4k) + 2(7m)(-4k)$$

$$= 49m^2 + 9n^2 + 16k^2 - 42mn + 24nk - 56mk$$

6.1

1) Factorise.

$$1) x^2 + 9x + 18$$

$$= 2x^2 + 2 = x^2 + 3x + 6x + 18$$

$$= x(x+3) + 6(x+3)$$

$$= (x+3)(x+6)$$

$$\begin{array}{r} 18 \\ \swarrow \searrow \\ 1 \quad 18 \\ 2 \quad 9 \\ (3)(6) = 18 \end{array}$$

$$2) x^2 - 10x + 9$$

$$= x^2 - 9x - x + 9$$

$$= x(x-9) - 1(x-9)$$

$$= (x-9)(x-1)$$

$$\begin{array}{r} 9 \\ \swarrow \searrow \\ 1 \quad 9 \\ -1 \quad -9 \\ (1)(9) = 9 \end{array}$$

$$3) y^2 + 24y + 144$$

$$y^2 + 24y + 144 = y(y+12) + 12(y+12)$$

$$= (y+12)(y+12)$$

$$\begin{array}{r} 144 \\ \swarrow \searrow \\ 12 \quad 12 \\ (12)(12) = 144 \end{array}$$

$$4) 5y^2 + 5y - 10$$

$$= 5y^2 + 10y - 5y - 10$$

$$= 5y(y+2) - 5(y+2)$$

$$= (y+2)(5y-5)(y+2)5(y-1)$$

$$= 5(y+2)(y-1)$$

$$\begin{array}{r} 50 \\ \diagdown \\ 1 \quad 15 \\ 2 \quad 25 \\ \hline -5 \quad 40 \end{array}$$

$$5) p^2 - 2p - 35$$

$$= p^2 + 5 - 7p - 35$$

$$= p(p+5) - 7(p+5)$$

$$= (p+5)(p-7)$$

$$\begin{array}{r} 35 \\ \diagdown \\ 1 \quad 35 \\ \hline +5 \quad -7 \end{array}$$

$$6) p^2 - 7p - 44$$

$$= p^2 - 11p + 4p - 44$$

$$= p(p-11) + 4(p-11)$$

$$= (p-11)(p+4)$$

$$\begin{array}{r} 44 \\ \diagdown \\ 1 \quad 44 \\ 2 \quad 22 \\ \hline +4 \quad -11 \end{array}$$

$$m^2 - 23m + 120$$

$$= m^2 - 8m - 15m + 120$$

$$= m(m-8) - 15(m-8)$$

$$= (m-8)(m-15)$$

120	120
1 120	1 120
2 60	2 60
3 40	3 40
4 30	4 30
5 24	5 24
6 20	6 20
8 15	8 15

$$m^2 - 15m + 100$$

$$= m^2 - 20m - 5m + 100$$

$$= m(m-20) - 5(m-20)$$

$$= (m-20)(m-5)$$

100
1 100
2 50
4 25
5 20

$$9) 3x^2 + 14x + 15$$

$$= 3x^2 + 9x + 5x + 15$$

$$= 3x(x+3) + 5(x+3)$$

$$= (x+3)(3x+5)$$

45
1 45
3 15
5 9

$$10) 2x^2 + x - 45$$

$$= 2x^2 + 10x - 9x - 45$$

$$= 2x(x+5) - 9(x+5)$$

$$= (x+5)(2x-9)$$



1	90
2	45
3	30
5	18
6	15
9	10

$$11) 20x^2 - 26x + 8$$

$$= 22x^2 - 16x - 10x + 18$$

$$= 4x(5x-4) - 2(5x-4)$$

$$= (5x-4)(4x-2)$$

1	160
2	80
4	40
5	32
8	20
10	16

$$12) 44x^2 - x - 3$$

$$= 44x^2 - 12x + 11x - 13$$

$$= 4x(11x-3) + 1(11x-3)$$

$$= (11x-3)(4x+1)$$

-132
12 11