

Assignment

DATE _____

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Ex-22(v)

1) Factorise:

a) $2x^2 + 3x + 1$

~~$\Rightarrow 2x^2 + (\quad)x + 1$~~

$\rightarrow 2x^2 + (2+1)x + 1$

$\rightarrow 2x^2 + 2x + x + 1$

$\rightarrow 2x(x+1) + 1(x+1)$

$\rightarrow (x+1)(2x+1)$

b) $2x^2 + 9x + 7$

$\rightarrow 2x^2 + (2+7)x + 7$

$\rightarrow 2x^2 + 2x + 7x + 7$

$\rightarrow 2x(x+1) + 7(x+1)$

$\rightarrow (x+1)(2x+7)$

c) $3x^2 + 8x + 4$

$\rightarrow 3x^2 + (2+6)x + 4$

$\rightarrow 3x^2 + 2x + 6x + 4$

$\rightarrow x(3x+2) + 2(3x+2)$

$\rightarrow (3x+2)(x+2)$

$$d) 3x^2 + 11x + 6$$

$$\rightarrow 3x^2 + (2+9)x + 6$$

$$\rightarrow 3x^2 + 2x + 9x + 6$$

$$\rightarrow x(3x+2) + 3(3x+2)$$

$$\rightarrow (3x+2)(x+3)$$

$$e) 4x^2 + 8x + 3$$

$$\rightarrow 4x^2 + (2+6)x + 3$$

$$\rightarrow 4x^2 + 2x + 6x + 3$$

$$\rightarrow 2x(2x+1) + 3(2x+1)$$

$$\rightarrow (2x+1)(2x+3)$$

$$f) 4x^2 + 13x + 10$$

$$\rightarrow 4x^2 + (8+5)x + 10$$

$$\rightarrow 4x^2 + 8x + 5x + 10$$

$$\rightarrow 4x(x+2) + 5(x+2)$$

$$\rightarrow (x+2)(4x+5)$$

$$g) 3x^2 + 10xy + 8y^2$$

$$\rightarrow 3x^2 + (6+4)xy + 8y^2$$

$$\rightarrow 3x^2 + 6xy + 4xy + 8y^2$$

$$\rightarrow 3x(x+2y) + 4y(x+2y)$$

$$\rightarrow (x+2y)(3x+4y)$$

h) $5a^2 + 12ab + 4b^2$

$\rightarrow 5a^2 + (10+2)ab + 4b^2$

$\rightarrow 5a^2 + 10ab + 2ab + 4b^2$

$\rightarrow 5a(a+2b) + 2b(a+2b)$

$\rightarrow (a+2b)(5a+2b)$

2. Resolve into factors:

a) $2x^2 - 5x + 3$

$\rightarrow 2x^2 - (2+3)x + 3$

$\rightarrow 2x^2 - 2x - 3x + 3$

$\rightarrow 2x(x-1) - 3(x-1)$

$\rightarrow (x-1)(2x-3)$

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

$\rightarrow 2x^2 - (4+5)x + 10$

$\rightarrow 2x^2 - 4x - 5x + 10$

$\rightarrow 2x(x-2) - 5(x-2)$

$\rightarrow (x-2)(2x-5)$

c) $3x^2 - 5x + 2$

$\rightarrow 3x^2 - (3+2)x + 2$

$\rightarrow 3x^2 - 3x - 2x + 2$

$\rightarrow 3x(x-1) - 2(x-1)$

$\rightarrow (x-1)(3x-2)$

d) $4x^2 - 12x + 5$

$\rightarrow 4x^2 - (2+10)x + 5$

$\rightarrow 4x^2 - 2x - 10x + 5$

$\rightarrow 2x(2x-1) - 5(2x-1)$

$\rightarrow (2x-1)(2x-5)$

e) $5x^2 - 14x + 8$

$\rightarrow 5x^2 - (10+4)x + 8$

$\rightarrow 5x^2 - 10x - 4x + 8$

$\rightarrow 5x(x-2) - 4(x-2)$

$\rightarrow (x-2)(5x-4)$

f) $6x^2 - 13x + 6$

$\rightarrow 6x^2 - (4+9)x + 6$

$\rightarrow 6x^2 - 4x - 9x + 6$

$\rightarrow 2x(3x-2) - 3(3x-2)$

$\rightarrow (3x-2)(2x-3)$

$$\begin{aligned} g) & 3x^2 - 10xy + 8y^2 \\ \rightarrow & 3x^2 - (6+4)xy + 8y^2 \\ \rightarrow & 3x^2 - 6xy - 4xy + 8y^2 \\ \rightarrow & 3x(x-2y) - 4y(x-2y) \\ \rightarrow & (x-2y)(3x-4y) \end{aligned}$$

$$\begin{aligned} h) & 7x^2 - 18x + 8 \\ \rightarrow & 7x^2 - (14+4)x + 8 \\ \rightarrow & 7x^2 - 14x - 4x + 8 \\ \rightarrow & 7x(x-2) - 4(x-2) \\ \rightarrow & (x-2)(7x-4) \end{aligned}$$

3. Factorise;

$$\begin{aligned} a) & 3x^2 + x - 2 \\ \rightarrow & 3x^2 + (3-2)x - 2 \\ \rightarrow & 3x^2 + 3x - 2x - 2 \\ \rightarrow & 3x(x+1) - 2(x+1) \\ \rightarrow & (x+1)(3x-2) \end{aligned}$$

$$b) 2x^2 + 3x - 9$$

$$\begin{aligned} &\rightarrow 2x^2 + (6-3)x - 9 \\ &\rightarrow 2x^2 + 6x - 3x - 9 \\ &\rightarrow 2x(x+3) - 3(x+3) \\ &\rightarrow (x+3)(2x-3) \end{aligned}$$

$$\begin{aligned} \text{c) } &5x^2 + x - 6 \\ &\rightarrow 5x^2 + (6-5)x - 6 \\ &\rightarrow 5x^2 + 6x - 5x - 6 \\ &\rightarrow 5x^2 - 5x + 6x - 6 \\ &\rightarrow 5x(x-1) + 6(x-1) \\ &\rightarrow (x-1)(5x+6) \end{aligned}$$

$$\begin{aligned} \text{d) } &4x^2 + 5x - 6 \\ &\rightarrow 4x^2 + (8-3)x - 6 \\ &\rightarrow 4x^2 + 8x - 3x - 6 \\ &\rightarrow 4x(x+2) - 3(x+2) \\ &\rightarrow (x+2)(4x-3) \end{aligned}$$

$$\begin{aligned} \text{e) } &6x^2 + 7x - 3 \\ &\rightarrow 6x^2 + (-2+9)x - 3 \\ &\rightarrow 6x^2 - 2x + 9x - 3 \\ &\rightarrow 2x(3x-1) + 3(3x-1) \\ &\rightarrow (3x-1)(2x+3) \end{aligned}$$

$$b) 8x^2 + 6x - 5$$

$$\rightarrow 8x^2 + (-4+10)x - 5$$

$$\rightarrow 8x^2 - 4x + 10x - 5$$

$$\rightarrow 4x(2x-1) + 5(2x-1)$$

$$\rightarrow (2x-1)(4x+5)$$

$$\begin{array}{r} 18 \\ \times 2 \\ \hline 36 \end{array}$$

$$g) 2x^2 + 5xy - 18y^2$$

$$\rightarrow 2x^2 + (-4+9)xy - 18y^2$$

$$\rightarrow 2x^2 - 4xy + 9xy - 18y^2$$

$$\rightarrow 2x(x-2y) + 9y(x-2y)$$

$$\rightarrow (x-2y)(2x+9y)$$

$$h) 9p^2 + 12pq - 5q^2$$

$$\rightarrow 9p^2 + (-3+15)pq - 5q^2$$

$$\rightarrow 9p^2 - 3pq + 15pq - 5q^2$$

$$\rightarrow 3p(3p-q) + 5q(3p-q)$$

$$\rightarrow (3p-q)(3p+5q)$$

4. Resolve into factors:

$$a) 2x^2 - x - 1$$

$$\rightarrow 2x^2 - (2-1)x - 1$$

$$\rightarrow 2x^2 - 2x + x - 1$$

$$\rightarrow 2x(x-1) + 1(x-1)$$

$$\rightarrow (x-1)(2x+1)$$

$$b) 2x^2 - 3x - 14$$

$$\rightarrow 2x^2 - (-4+7)x - 14$$

$$\rightarrow 2x^2 + 4x - 7x - 14$$

$$\rightarrow 2x(x+2) - 7(x+2)$$

$$\rightarrow (x+2)(2x-7)$$

$$c) 3x^2 - 4x - 15$$

$$\rightarrow 3x^2 - (9-5)x - 15$$

$$\rightarrow 3x^2 - 9x + 5x - 15$$

$$\rightarrow 3x(x-3) + 5(x-3)$$

$$\rightarrow (x-3)(3x+5)$$

$$d) 5x^2 - 2x - 16$$

$$\rightarrow 5x^2 - (10-8)x - 16$$

$$\rightarrow 5x^2 - 10x + 8x - 16$$

$$\rightarrow 5x(x-2) + 8(x-2)$$

$$\rightarrow (x-2)(5x+8)$$

$$c) 8x^2 - 6x - 9$$

$$\rightarrow 8x^2 - (12 - 6)x - 9$$

$$\rightarrow 8x^2 - 12x + 6x - 9$$

$$\rightarrow 4x(2x - 3) + 3(2x - 3)$$

$$\rightarrow (2x - 3)(4x + 3)$$

$$f) 4x^2 - 20x - 11$$

$$\rightarrow 4x^2 - (-2 + 22)x - 11$$

$$\rightarrow 4x^2 + 2x - 22x - 11$$

$$\rightarrow 2x(2x + 1) - 11(2x + 1)$$

$$\rightarrow (2x + 1)(2x - 11)$$

$$g) 4x^2 - 17xy - 15y^2$$

$$\rightarrow 4x^2 - (20 - 3)xy - 15y^2$$

$$\rightarrow 4x^2 - 20xy + 3xy - 15y^2$$

$$\rightarrow 4x(x - 5y) + 3y(x - 5y)$$

$$\rightarrow (x - 5y)(4x + 3y)$$

$$h) 6m^2 - 7mn - 5n^2$$

$$\rightarrow 6m^2 - (\overset{-3+10}{-13+10})mn - 5n^2$$

$$\rightarrow 6m^2 + 3mn - 10mn - 5n^2$$

$$\rightarrow 3m(2m + n) - 5n(2m + n)$$

$$\rightarrow (2m + n)(3m - 5n)$$

Mix Exercise

Factorise:

1) $mx - my$
 $\rightarrow m(x - y)$

2) $10xy^2 - 15y^3z$
 ~~$\rightarrow 5(2x - 3y^2z)$~~

$\rightarrow 5x^2x \times yxy - 5x^3xyxyxz$
 $\rightarrow 5y(2xy - 3y^2z)$

3) $xy + 3y + 2x + 6$
 $\rightarrow y(x + 3) + 2(x + 3)$
 $\rightarrow (x + 3)(y + 2)$

4) $a^2 + 3b + 3a + ab$
 ~~$\rightarrow a^2 + 3a + 3b + ab$~~ $a^2 + ab + 3a + 3b$
 $\rightarrow a(a + b) + 3(a + b)$
 $\rightarrow (a + b)(a + 3)$

5) $x^2 + 4x + 3$

$$\rightarrow x^2 + (1+3)x + 3$$

$$\rightarrow x^2 + x + 3x + 3$$

$$\rightarrow x(x+1) + 3(x+1)$$

$$\rightarrow (x+1)(x+3)$$

$$6) x^2 - 6x + 8$$

$$\rightarrow x^2 - (2+4)x + 8$$

$$\rightarrow x^2 - 2x - 4x + 8$$

$$\rightarrow x(x-2) - 4(x-2)$$

$$\rightarrow (x-2)(x-4)$$

$$7) a^2 - 14a + 48$$

$$\rightarrow a^2 - (6+8)a + 48$$

$$\rightarrow a^2 - 6a - 8a + 48$$

$$\rightarrow a(a-6) - 8(a-6)$$

$$\rightarrow (a-6)(a-8)$$

$$\begin{aligned} 8) \quad & 9x^2 - 36 \\ & \rightarrow (3x)^2 - (6)^2 \\ & \rightarrow (3x+6)(3x-6) \end{aligned}$$

$$\begin{aligned} 9) \quad & 144x^2 - 169y^2 \\ & \rightarrow (12x)^2 - (13y)^2 \\ & \rightarrow (12x+13y)(12x-13y) \end{aligned}$$

$$10) \quad 2x^8 - 2$$

$$\rightarrow 2(x^8 - 4)$$

$$\rightarrow 2((x^4)^2 - (2)^2)$$

$$\rightarrow 2(x^4 + 2)(x^4 - 2)$$

$$\rightarrow 2(x^4 + 2)\{(x^2)^2 - (\sqrt{2})^2\}$$

$$\rightarrow 2(x^4 + 2)(x^2 + \sqrt{2})(x^2 - \sqrt{2})$$