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Assignment

Factorisation

Exercise 22(I)

1. Factorise:

a) $xy + yz$

-> Soln,

$$xy + yz = y(x + z)$$

b) $3ax + 4a$

-> Soln,

$$3ax + 4a = a(3x + 4)$$

c) $2x + 6y$

-> Soln,

$$2x + 6y = 2(x + 3y)$$

->

d) $2x^2+4x$

-> Soln,

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

e) $4ax^2-6ax$

-> Soln

Here,

$4ax^2-6ax = 2ax(2x-3)$

f) $10ab^2-15a^2b$

-> Soln,

$10ab^2-15a^2b = 5ab(2b-3a)$

g) $2a^2x^2-6abx+4ab^2x^3$

-> Soln,

$2a^2x^2-6abx+4ab^2x^3 = 2ax(ax-3b+2b^2x^2)$

h) $12p^3x^2-15p^2x^3+9p^2x^2$

-> Soln,

$12p^3x^2-15p^2x^3+9p^2x^2 =$

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

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

2. Resolve into factors:

a) a(x+a) + b(x+a)

→ (x+a)(a+b)

b) p(x-y) - q(x-y) - q(x-y)

→ (x-y)(p-q)

c) x(y+3) - 4(y+3)

→ (y+3)(x-4)

d) 2y(x-5) + 3(x-5)

→ (x-5)(2y+3)

e) 3x(2x+3) - 5(2x+3)

→ (2x+3)(3x-5)

f) 2x(x+y-z) - y(x+y-z) + 3z(x+y-z)

→ (x+y-z)(2x-y+3z)

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3) Factorise;

a) $am+bn+an+bm$

~~→ $(am+bn)(an+bm)$ - m(a~~

→ $(am+an)(bm+bn)$

→ $a(m+n)+b(m+n)$

→ $(m+n)(a+b)$

b) $x^2+2x+3x+6$

→ $(x^2+2x)+(3x+6)$

→ $x(x+2)+3(x+2)$

→ $(x+2)(x+3)$

c) $xy-3x+y^2-3y$

→ $(xy-3x)+(y^2-3y)$

→ $x(y-3)+y(y-3)$

→ ~~$(x+y)($~~ $(y-3)(x+y)$

d) $mn+5m+6n+30$

→ $(mn+5m)+(6n+30)$

→ $m(n+5)+6(n+5)$

→ $(n+5)($~~n~~ $m+6)$

e) $pq-3p+4q-12$

$\rightarrow (pq-3p)+(4q-12) = p(q-3)+4(q-3)$

$= (q-3)(p+4)$

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f) $2p^2-3pq+2pr-3qr$

$\rightarrow (2p^2-3pq)+(2pr-3qr)$

$\rightarrow p(2p-3q)+r(2p-3q)$

$\rightarrow (2p-3q)(p+r)$

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g) $xy-x+y-1$

$\rightarrow (xy-x)+(y-1)$

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

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

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h) $x^3+2x^2y-2xy-4y^2$

~~$\rightarrow (x^3+2x^2y)$~~

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

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

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

$\longrightarrow$

i) $a^2-(b-1)a-b$

$\rightarrow$ ~~$a^2-b+1+a-b$~~ $(a^2-ab)+(a-b)$

$\rightarrow$ $a(a-b)+1(a-b)$

$\rightarrow$ $(a-b)(a+1)$

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j) $x^2-(a+b)x+ab$

$\rightarrow (x^2-ax)-(bx+ab)$

$\rightarrow x(x-a)-b(x-a)$

$\rightarrow (x-a)(x-b)$

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k) $x^2-(a+2b)x+2ab$

$\rightarrow (x^2-ax)-(2bx+2ab)$

$\rightarrow x(x-a)-2b(x-a)$

$\rightarrow (x-a)(x-2b)$

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l) $ab(x^2+y^2)-xy(a^2+b^2)$

~~$\rightarrow (abx^2+aby^2)(-a^2xy-b^2xy)$~~

~~$\rightarrow ab(x^2+y^2)$~~

$\rightarrow abx^2+aby^2-a^2xy-b^2xy$

$\rightarrow (abx^2-a^2xy)(-b^2xy+aby^2)$

$\rightarrow ax(bx-ay)-by(bx-ay)$

$\rightarrow (bx-ay)(ax-by)$
