Solutions

Factoring Review – sheet 9

Do all work in the space provided.

1. Common factor each of the following.

a) $25xy + 15x^2$

b) $12m^2n - 8mn + 20mn^2$

c) $25x^3 + 10x^2 - 35x^4$

d) $7rst - 14r^2s^2t$

e) $9a^4b^5 - 15a^3b^7 + 6a^4b^4 - 21a^3b^4 - 30a^5b^5$

2. Trinomial factor each f the following.

a) $m^2 + 5m + 6$

$(m+3)(m+2)$

b) $y^2 + 13yz + 42z^2$

$(y+7z)(y+6z)$

c) $x^4 + 8x^2 - 20$

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

d) $d^2 - 6df - 16f^2$

$(d-8f)(d+2f)$

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

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

f) $w^2 - 15w - 76$

$(w-19)(w+4)$

g) $x^4 - 20x^2y^2 + 100y^4$

$(x^2-10y^2)(x^2-10y^2)$

3. Trinomial factor each of the following.

a) $2x^2 - 11x + 12$

$2 \quad -3$
$1 \quad -4$

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

b) $6a^2 - 19a + 10$

$3 \quad -2$
$2 \quad -5$

$(3a-2)(2a-5)$

c) $4w^2 - 4wx - 15x^2$

$(2w-5x)(2w+3x)$

$2 \quad -5$
$2 \quad 3$

d) $2x^2 + x - 15$

$2 \quad -5$
$1 \quad 3$

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

e) $6k^2 - 17kx + 5x^2$

$= (3k-x)(2k-5x)$

$3 \quad -1$
$2 \quad -5$

f) $6c^2 + 17c + 10$

$= (6c+5)(c+2)$

$6 \quad 5$
$1 \quad 2$

4. Factor using a difference of squares.

a) $144x^2 - 9$

$(12x-3)(12x+3)$

b) $25y^2 - 81$

$(5y-9)(5y+9)$

c) $49y^2 - 4x^2$

$(7y-2x)(7y+2x)$

d) $(x + 8)^2 - 64$

$[(x+8)-8][(x+8)+8]$

$(x)(x+16)$

e) $25 - (m - n)^2$

$[5-(m-n)][5+(m-n)]$

$= (5-m+n)(5+m-n)$

f) $(x - y)^2 - (x + 8)^2$

$[(x-y)+(x+8)][(x-y)-(x+8)]$

$= (2x-y+8)(-y-8)$

5. Factor completely.

a) $3x^2 + 24x + 21$

$3(x^2+8x+7)$

$3(x+7)(x+1)$

b) $3x^2 - 48$

$3(x^2-16)$

$3(x-4)(x+4)$

c) $2a^4 - 32$

$2(a^4-16)$

$2(a^2-4)(a^2+4)$

$2(a-2)(a+2)(a^2+4$

d) $12x^3 - 27x$

$3x(4x^2-9)$

$3x(2x-3)(2x+3)$

e) $9x^2 - 36x - 45$

$9(x^2-4x-5)$

$9(x-5)(x+1)$

f) $2bx^2 + 30bx - 108b$

$2b(x^2+15x-54)$

$2b(x+18)(x-3)$

g) $24x^3 + 30x^2 + 9x$

$3x(8x^2+10x+3)$

$3x(2x+1)(4x+3)$

2 1
4 3

h) $3x^2 + 11x + 10$

$(3x+5)(x+2)$

3 5
1 2

i) $x^2 + xy + 3x + 3y$

$x(x+y)+3(x+y)$

$(x+y)(x+3)$

j) $3x^2y^2 - 6xy^3 + 15xy^2$

$3xy^2(x-2y+5)$

k) $(x-4)^2 - 49y^2$

$=[(x-4)-7y][(x-4)+7y]$

$=(x-7y-4)(x+7y-4)$

l) $x^2 + 4x + 4 - 25y^2$

$(x+2)^2-25y^2$

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

m) $16x^4 - 1$

$(4x^2-1)(4x^2+1)$

$(2x-1)(2x+1)(4x^2+1)$

n) $9x^2 + 12xy + 4y^2 - (x+2y)^2$

$(3x+2y)^2-(x+2y)^2$

$[3x+2y+x+2y][3x+2y-x-2y]$

$(4x+4y)(2x)$

$8x(x+y)$

o) $\underline{36x^2m^2 - 168xym^2 + 196y^2m^2} - 16m^2$

$=4m^2(9x^2-42xy+49y^2)-16m^2$

$=4m^2(3x-7y)^2-16m^2$

$=4m^2[(3x-7y)^2-4]$

$=4m^2(3x-7y-2)(3x-7y+2)$