

Worksheet 2015-10 EB-00006(2) - Factorisation

Factorise completely:

(1) $a(m - n) + a^2 - mn$

$$= am - an + a^2 - mn$$

$$= am + a^2 - an - mn$$

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

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

(2) $p^4q^4 - 13p^2q^2 + 36$

$$= (p^2q^2 - 9)(p^2q^2 - 4)$$

$$= (pq-3)(pq+3)(pq-2)(pq+2)$$

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

$$= [(2x-y) - (x+2y)][(2x-y) + (x+2y)]$$

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

$$= (x-3y)(3x+y)$$

(4) $15m^2 - 1mn - 2n^2$

$$= (5m-2n)(3m+1n)$$

5	$\begin{matrix} - \\ + \end{matrix}$	2	-6
3		1	+5
15		2	-1

(5) $-yr^6 + 64y$

$$= -y(r^6 - 64)$$

$$= -y(r^3 - 8)(r^3 + 8)$$

$$= -y(r-2)(r^2+2r+4)(r+2)(r^2-2r+4)$$

$$(6) \quad x^2 - a^2 + 2ab - b^2$$

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

$$= x^2 - (a-b)(a-b)$$

$$= x^2 - (a-b)^2$$

$$= [x - (a-b)][x + (a-b)]$$

$$= (x - a + b)(x + a - b)$$

$$(7) \quad d^4(t^2 + 7t + 6) - k^6(t^2 + 6 + 7t)$$

$$= (t^2 + 7t + 6)(d^4 - k^6)$$

$$= (t+6)(t+1)(d^2 - k^3)(d^2 + k^3)$$

$$(8) \quad \frac{125m^6}{2} - 4$$

$$= \frac{125m^6 - 8}{2}$$

$$= \frac{(5m^2 - 2)(25m^4 + 10m^2 + 4)}{2}$$

$$(9) \quad (2p - 7)^2 + 7(2p - 7) - 18 \quad \text{or directly}$$

$$\text{Let } (2p - 7) = k$$

$$\therefore k^2 + 7k - 18 = (k + 9)(k - 2)$$

$$= [(2p - 7) + 9][(2p - 7) - 2]$$

$$= (2p - 7 + 9)(2p - 7 - 2)$$

$$= (2p + 2)(2p - 9)$$

$$= 2(p + 1)(2p - 9)$$

* See alternative on next page!

$$(10) \quad y^2 - 4y + 4 - 3my + 6m$$

$$= (y - 2)(y - 2) - 3m(y - 2)$$

$$= (y - 2)[(y - 2) - 3m]$$

$$= (y - 2)(y - 2 - 3m)$$

$$(9) \quad (2p - 7)^2 + 7(2p - 7) - 18$$

$$= (2p-7)(2p-7) + 7(2p-7) - 18$$

$$= 4p^2 - 14p - 14p + 49 + 14p - 49 - 18$$

$$= 4p^2 - 14p - 18$$

$$= 2(2p^2 - 7p - 9)$$

$$= 2(2p - 9)(p + 1)$$