

HW Solutions

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

$$\textcircled{30} \quad x^2 - 2x - 4y^2 = 4y$$

$$x^2 - 4y^2 - 2x - 4y$$

$$\textcircled{(x+2y)} \textcircled{(x-2y)} - 2 \textcircled{(x+2y)}$$

$$\textcircled{(x+2y)(x-2y-2)}$$

$$\textcircled{32} \quad 16x^2 + 16y - y^2 - 64$$

$$16x^2 - y^2 + 16y - 64$$

$$16x^2 - (y^2 - 16y + 64)$$

$$16x^2 - (y - 8)^2$$

$$(4x + (y - 8))(4x - (y - 8))$$

$$(4x + y - 8)(4x - y + 8)$$

$$\textcircled{8} \quad 6c^2 + 18cd + 12d^2$$

$$6(c^2 + 3cd + 2d^2)_{1,2}$$

$$6(c + 2d)(c + d)$$

$$\textcircled{10} \quad 3xy^2 - 27x^3$$

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

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

$$\textcircled{44} \quad (u-v)^3 + (v-u)$$

$$(u-v)^3 - (u-v) \quad \begin{matrix} x^3 - x \\ x(x^2 - 1) \end{matrix}$$

$$(u-v)((u-v)^2 - 1)$$

$$(u-v)(u-v+1)(u-v-1)$$

$$\textcircled{40} (x-2)(x^2-1) - 6x-6$$

$$(x-2)(\underline{x+1})(x-1) - 6(\underline{x+1})$$

$$(x+1)((x-2)(x-1) - 6)$$

$$(x+1)(x^2 - 3x + 2 - 6)$$

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

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

(x x)

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

$$\begin{aligned}
 \text{E10 } & 4 - 4x^2 - 4y^2 + 8xy \\
 & 4 - \underline{4x^2 + 8xy - 4y^2} \\
 & 4(1 - x^2 + 2xy - y^2) \\
 & 4(1 - (x^2 - 2xy + y^2)) \\
 & 4(1 - (x - y)^2) \\
 & \underline{4(1 + (x - y))(1 - (x - y))} \\
 & 4(1 + x - y)(1 - x + y)
 \end{aligned}$$

$$\textcircled{42} \quad x(\underline{x+1})(x-4) + 4(\underline{x+1})$$

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

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

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

$$\textcircled{34} \quad \underline{8a^3 + 4a^2b - 2ab^2 - b^3}$$

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

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

$$\textcircled{(2a+b)} \quad \textcircled{(2a+b)} \quad (2a-b)$$

$$\textcircled{(2a+b)^2 (2a-b)}$$

$$(48) \quad x^4 - x^2 + 4x - 4$$

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

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

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

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

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

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

$$\textcircled{38} \quad 3x^5 + 15x^3 - 108x$$

$$3x(x^4 + 5x^2 - 36)$$

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

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

1-36
2-18
3-12
4-9
6-6

Q28

$$a^2 - b^2 + \underline{ac - bc}$$
$$(a+b)(\underline{a-b}) + c(\underline{a-b})$$

$$(a-b)(a+b+c)$$

$$\text{QD} \quad \underline{x^2 - 4y^2} - \underline{4x} + \underline{4}$$

$$x^2 - 4x + 4 - 4y^2$$

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

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

$$\begin{aligned} & 2.8 \quad 180x^2y - 108xy^2 - 75x^3 \\ & 3x(60xy - 36y^2 - 25x^2) \\ & 3x(-25x^2 + 60xy - 36y^2) \\ & - 3x(25x^2 - 60xy + 36y^2) \\ & \underline{- 3x(5x - 6y)^2} \end{aligned}$$

$$Q2 \quad n(n^2 - 1) + n(n-1)$$

$$\underline{n}(n+1)\underline{(n-1)} + \underline{n}(n-1)$$

$$n(n-1)(n+1+1)$$

$$\underline{n(n-1)(n+2)}$$

Factoring Completely

- 1) Factor out the greatest monomial factor
- 2) Look for difference of two squares
- 3) Look for a perfect square trinomial
- 4) If a trinomial is not a square, look for a pair of binomial factors
- 5) If there are 4 or more terms, look for a way to group them in pairs or in a group of three that is a perfect square trinomial.
- 6) Make sure that each factor is prime.

Showdown

$$\underline{100} + \underline{4x^2} - 16y^2 - \underline{40x}$$

$$4x^2 - 40x + 100 - 16y^2$$

$$4(x^2 - 10x + 25) - 4y^2$$

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

$$4(x - 5 + 2y)(x - 5 - 2y)$$

$$(2x+1)(3x-5) - 3(2x+1)$$

$$(2x+1)(3x-5-3)$$

$$(2x+1)(3x-8)$$

$$a^4 - b^4$$

$$2u^5 - 7u^3 - 4u$$

$$x^2 - xy - x + y$$

$$r^2 - 6r - 9s^2 + 9$$

$$p^2 - 1 - 4q^2 - 4q$$

$$6u^2v - 11u^2v^2 - 10u^2v^3$$

$$16c^{16} - 16$$

$$k(k + 1)(k + 2) - 3k(k + 1)$$

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

$$(a + b)^2 - (a - c)^2$$

$$2pq + 2pr + q^2 - r^2$$

$$u^2 - 4v^2 + 3u - 6v$$

$$a(a^2 - 9) - 2(a + 3)^2$$

$$a(a + 2)(a - 3) - 8(a - 3)$$