# More about factorization

## Solution

**5.** (a) $x^2 + 9x + 20 = (x+5)(x+4)$

(b) $y^2 + y - 72 = (y+9)(y-8)$

**6.** (a) $2x^2 + 3x + 1$
$= (2x+1)(x+1)$

(b) $5x^2 + 7x - 6$
$= (5x-3)(x+2)$

(c) $6a^2 - 2 - a$
$= 6a^2 - a - 2$
$= (3x-2)(2x+1)$

(d) $6y + 7 - y^2 = -(y^2 - 6y - 7)$
$= -(y-7)(y+1)$
$= (y+1)(7-y)$

**7.** (a) $14b^2 - 13b + 3$
$= (7b-3)(2b-1)$

(b) $16p^2 + 26p + 9 = (2p+1)(8p+9)$

(c) $23y - 10y^2 - 12 = -(10y^2 - 23y + 12)$
$= -(2y-3)(5y-4)$
$= (3-2y)(5y-4)$

**8.** (a) $t^2 - 9st + 14s^2 = (t-2s)(t-7s)$

(b) $16(y+5)^2 + 30(y+5) + 9$
$= [2(y+5)+3][8(y+5)+3]$
$= (2y+13)(8y+43)$

**9.** (a) $2x^2 + 2x - 24 = 2(x^2 + x - 12)$
$= 2(x+4)(x-3)$

(b) $6x^2 + 9x - 60 = 3(2x^2 + 3x - 20)$
$= 3(2x-5)(x+4)$

(c) $54(3-k^2)^2 - 96(3-k^2) - 24$
$= 6[9(3-k^2)^2 - 16(3-k^2) - 4]$
$= 6[9(3-k^2)+2][(3-k^2)-2]$
$= 6(29-9k^2)(1-k^2)$
$= 6(1+k)(1-k)(29-9k^2)$

**10.** (a) $t^3 - 8 = t^3 - 2^3$
$= (t-2)(t^2 + 2t + 4)$

(b) $192x^3 - 375y^3$
$= 3(64x^3 - 125y^3)$
$= 3[(4x-5y)(16x^2 + 20xy + 25y^2)]$
$= 3(4x-5y)(16x^2 + 20xy + 25y^2)$

**11.** (a) $2m^3 + 16n^3$
$= 2(m^3 + 8n^3)$
$= 2(m+2n)(m^2 - 2mn + 4n^2)$

(b) $125 + a^3c^3$
$= 5^3 + (ac)^3$
$= (5+ac)(25 - 5ac + a^2c^2)$