

Lesson 5: Factoring Special Polynomials

Are You Ready? Possible Solutions

1. a. $64x^4 = (2)(2)(2)(2)(2)(2)(x)(x)(x)(x)$
square root of $64x^2 = (2)(2)(2)(x)(x) = 8x^2$

b. $x^2y^2 = (x)(x)(y)(y)$
square root of $x^2y^2 = xy$

c. $(x - 1)^2 = (x - 1)(x - 1)$
square root of $(x - 1)^2 = (x - 1)$
2. a. $(x+2)(x+5) = x(x+5) + 2(x+5)$
 $= x^2 + 5x + 2x + 10$
 $= x^2 + 7x + 10$

b. $(2x + 3)(2x - 3) = 2x(2x - 3) + 3(2x - 3)$
 $= 4x^2 - 6x - 6x - 9$
 $= 4x^2 - 12x - 9$

c. $(3x - 1)(3x - 1) = 3x(3x - 1) - 1(3x - 1)$
 $= 9x^2 - 3x - 3x + 1$
 $= 9x^2 - 6x + 1$

d. $(x + 3)(x + 3) - x(x) = x(x + 3) + 3(x + 3) - x^2$
 $= x^2 + 3x + 3x + 9 - x^2$
 $= 6x + 9$
3. a. $x^2 + 4x + 4 = (x + 2)(x + 2)$
b. $x^2 - 4 = (x + 2)(x - 2)$
c. $2x^2 - 2x = (2x)(x - 1)$
d. $6x^2 - 7x + 2 = (3x - 2)(2x - 1)$
4. a. $3x^3 + 6x^2 - 12x = 3x(x^2 + 2x - 4)$

b. product = -45, sum = -4

The numbers are -9 and 5.

$$x^2 - 4x - 45 = (x - 9)(x + 5)$$

c.

Product	Sum	Numbers
$4 \times 9 = 36$	12	6 and 6

$$\begin{aligned}4x^2 + 12x + 9 &= (4x^2 + 6x) + (6x + 9) \\&= 2x(2x + 3) + 3(x + 3) \\&= (2x + 3)(2x + 3)\end{aligned}$$