

Module 2.C: Algebra- Simplifying Expressions

SECTION 1 : Factor a polynomial.

- Begin by factoring out a common factor. Keep in mind not all polynomials may be factored.
- A polynomial that cannot be factored is called a prime polynomial.
- A polynomial that is factored *completely* consists of factors that are all prime.
- Remember some polynomials are prime, others are not. If a polynomial has a factor present in each term, the polynomial can be factored further.

EXERCISE 5

Factor: a) $x^2 - 8x + 15$

b) $x^2 - 5x - 24$

SOLUTION:

a) $x^2 - 8x + 15 = (x - 3)(x - 5)$

b) $x^2 - 5x - 24 = (x - 8)(x + 3)$

SECTION 2 : Factor one of the special form polynomials.

Special Forms to recognize when factoring

- Difference of Squares $a^2 - b^2 = (a + b)(a - b)$
- Perfect Square $a^2 + 2ab + b^2 = (a + b)^2$ and $a^2 - 2ab + b^2 = (a - b)^2$
- Difference of Cubes $a^3 - b^3 = (a - b)(a^2 + ab + b^2)$
- Sum of Cubes $a^3 + b^3 = (a + b)(a^2 - ab + b^2)$
- Perfect Cubes $a^3 + 3a^2b + 3ab^2 + b^3 = (a + b)^3$ and $a^3 - 3a^2b + 3ab^2 - b^3 = (a - b)^3$

EXERCISE 6

Factor. a) $x^2 - 49$

b) $9a^2 + 6ab + b^2$

c) $y^3 - 27$

SOLUTION

a) $x^2 - 49 = (x + 7)(x - 7)$

b) $9a^2 + 6ab + b^2 = (3a)^2 + 2 \cdot (3a)(b) + b^2 = (3a + b)^2$

c) $y^3 - 27 = (y - 3)(y^2 + 3y + 9)$

MODULE 2.C - ASSESSMENT

_____7. Factor: $x^2 - 7x + 12$

- A** $(x+4)(x+3)$ **B** $(x-4)(x-3)$ **C** $(x-6)(x-2)$
D none of these **E** I do not know

_____8. Factor: $x^2 - 3x - 54$

- A** $(x-9)(x+6)$ **B** $(x+9)(x-6)$ **C** $(x-18)(x-3)$
D none of these **E** I do not know

_____9. Factor. $x^2 + 49$

- A** $(x-7)(x+7)$ **B** $(x-7)(x-7)$ **C** $(x+7)(x+7)$
D none of these **E** I do not know

_____10. Factor: $4a^2 - 4ab + b^2$

- A** $(2a-2b)^2$ **B** $(2a-b)^2$ **C** $(2a+b)^2$
D none of these **E** I do not know