



DATE: 8/23/23

SECTION: 1.2

OBJECTIVE: I can factor polynomials.

Vocabulary

Factor: Polynomial used to multiply

Constant: The number in equation; when the exponent of variable is zero $3x^0 = 3 \cdot 1 = 3$

Coefficient: Number multiplying variable $(3)x^2y$

When factoring **ALWAYS** look for a greatest common factor or GCF !!!

Factoring Identities

1. difference of squares $(a+b)(a-b) = a^2 - b^2$
2. perfect sq. trinomial $(a \pm b)^2 = a^2 \pm 2ab + b^2$
3. difference or sum of cubes $a^3 \pm b^3 = (a \pm b)(a^2 \mp ab + b^2)$

EXAMPLES

Factor each expression using the polynomial identities where possible. If you used an identity, write the identity you used. Show work if it is not an identity!

1. $x^2 + 3x + 2$

$ax^2 + bx + c$

$x^2 + 1x + 2x + 2$

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

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

2. $3x^2 - x - 2$

$3x^2 - 3x + 2x - 2$

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

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

3. $4x^2 - 16$

$4(x^2 - 4)$

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

4. $4x^2 + 9$

not factorable

5. $4x^2 - 12x + 9$

$(2x - 3)^2$

6. $27x^3 + 8$ sum of cubes

$(3x+2)(9x^2 - 6x + 4)$

7. $8x^3 - 125$

$(2x-5)(4x^2+10x+25)$

8. $32x^3 - 4y^3$

$4(8x^3 - y^3)$

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

9. $6x^2 - 4x - 16$

$2(3x^2 - 2x - 8)$

$2(3x^2 - 6x + 4x - 8)$

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

These are quadratic in form. Factor the same way, just change the variable.

10. $x^4 - 25$

$(x^2+5)(x^2-5)$

11. $5x^6 + 7x^3 + 2$

$5x^6 + 5x^3 + 2x^3 + 2$

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

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

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

12. $2x^2 - 9x + 6$

not factorable

Expand the product using polynomial identities, if possible. Show work if it is not an identity!

13. $(5x - 6)(5x + 6)$

$25x^2 - 36$

14. $(4x + 5)^2$

$(4x+5)(4x+5)$

$16x^2 + 40x + 25$

15. $(2x - 5)^3$

$(2x-5)(2x-5)(2x-5)$

$(4x^2 - 20x + 25)(2x-5)$

	$4x^2$	$-20x$	$+25$
$2x$	$8x^3$	$-40x^2$	$50x$
-5	$-20x^2$	$-100x$	-125

$8x^3 - 60x^2 - 50x - 125$