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Date _____
Algebra 2

Factoring by Grouping

Factor the following polynomials

1. $x^3 - 5x^2 + 2x - 10$

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

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

2. $x^3 + 3x^2 + 4x + 12$

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

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

3. $x^3 + 7x^2 + x + 7$

$x^2(x+7) + 1(x+7)$

$(x^2+1)(x+7)$

4. $x^3 - 8x^2 + 2x - 16$

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

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

5. $x^3 + 12x^2 - 2x - 24$

$x^2(x+12) - 2(x+12)$

$(x^2-2)(x+12)$

6. $x^3 + 6x^2 - 3x - 18$

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

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

7. $x^3 + 5x^2 - x - 5$

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

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

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

8. $x^3 + 4x^2 - 2x - 8$

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

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

9. $8x^3 + 2x^2 + 12x + 3$

$2x^2 \quad 2x^2 \quad 3 \quad 3$

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

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

10. $4x^3 + 12x^2 - 3x - 9$

$4x^2 \quad 4x^2 \quad -3 \quad -3$

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

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

11. $x^3 + 3x^2 - 9x - 27$

$x^2 \quad x^2 \quad -9 \quad -9$

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

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

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

12. $x^3 + 10x^2 - 9x - 90$

$x^2 \quad x^2 \quad -9 \quad -9$

$x^2(x+10) - 9(x+10)$

DOTS $(x^2-9)(x+10)$

$(x+3)(x-3)(x+10)$

13. $8x^3 + 12x^2 - 2x - 3$

$4x^2 \quad 4x^2 \quad -1 \quad -1$

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

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

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

14. $27x^3 + 36x^2 - 12x - 16$

$9x^2 \quad 9x^2 \quad -4 \quad -4$

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

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

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

15. $9x^3 + 18x^2 - x - 2$

$9x^2 \quad 9x^2 \quad -1 \quad -1$

$9x^2(x+2) - 1(x+2)$

DOTS $(9x^2-1)(x+2)$

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

16. $x^3y^2 + 4x^2y^2 - 4x - 16$

$x^2y^2 \quad x^2y^2 \quad -4 \quad -4$

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

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

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