

## Getting Ready for Algebra II - Factoring

KEY

I. Factor out the common factors from the terms of the polynomial.

1.  $14m^4 - 12m$

$$2m(7m^3 - 6)$$

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

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

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

$$x^3y(1 + 6x^2y)$$

4.  $x^5 + x^4 + x^3 - x^2$

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

5.  $4a^4b^4 - 2a^3b^2 + 6a^2$

$$2a^2(2a^2b^4 - ab^2 + 3)$$

6.  $2x^3y - 4x^2y + x^2$

$$x^2(2xy - 4y + 1)$$

II. Factor the difference of two perfect squares.

7.  $16x^4 - 25y^2$

$$(4x^2 + 5y)(4x^2 - 5y)$$

8.  $9a^2 - 16$

$$(3a + 4)(3a - 4)$$

9.  $81x^2 - 25y^6$

$$(9x + 5y^3)(9x - 5y^3)$$

10.  $36x^2 - 121y^2$

$$(6x + 11y)(6x - 11y)$$

11.  $100a^4 - 49b^6$

$$(10a^2 + 7b^3)(10a^2 - 7b^3)$$

12.  $64x^2 - 169y^8$

$$(8x + 13y^4)(8x - 13y^4)$$

III. In each problem below, factor out the GCF and then factor the difference of two perfect squares.

13.  $27x^2 - 48y^2$

$$3(9x^2 - 16y^2)$$

$$\Rightarrow 3(3x + 4y)(3x - 4y)$$

14.  $16x - 81x^3 \rightarrow x(16 - 81x^2)$

$$x(4 + 9x)(4 - 9x)$$

15.  $24x^2 - 54y^4$

$$6(4x^2 - 9y^4)$$

$$\Rightarrow 6(2x + 3y^2)(2x - 3y^2)$$

16.  $32x^3y - 50y^3x$

$$2xy(16x^2 - 25y^2)$$

$$2xy(4x + 5y)(4x - 5y)$$

IV. Factoring a trinomial in the form  $x^2 + bx + c$

17.  $x^2 + 9x + 14$

$$(x + 7)(x + 2)$$

18.  $x^2 - 14x + 48$

$$(x - 6)(x - 8)$$

19.  $x^2 - 9x + 20$

$$(x - 5)(x - 4)$$

20.  $x^2 - 2x - 99$

$$(x - 11)(x + 9)$$

21.  $x^2 + x - 56$

$$(x + 8)(x - 7)$$

22.  $a^2 + 2a - 35$

$$(a + 7)(a - 5)$$

23.  $b^2 + 9b - 90$

$$(b+15)(b-6)$$

25.  $x^2 + 6x - 72$

$$(x+12)(x-6)$$

V. Factoring a trinomial in the form  $ax^2 + bx + c$ 

27.  $2x^2 - 7x - 4$

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

29.  $6x^2 - 13x + 6$

$$(3x-2)(2x-3)$$

$\begin{array}{c} -4x \\ -9x \end{array}$

31.  $8x^2 + 10x - 3$

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

$\begin{array}{c} -2x \\ 12x \end{array}$

33.  $6x^2 + 4x - 10$

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

$\begin{array}{c} 10x \\ -6x \end{array}$

24.  $y^2 - 3y - 28$

$$(y-7)(y+4)$$

26.  $x^2 - 21x - 100$

$$(x-25)(x+4)$$

28.  $3x^2 - 4x - 15$

$$(3x+5)(x-3)$$

30.  $2x^2 + 7x + 3$

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

$\begin{array}{c} 1x \\ 6x \end{array}$

32.  $6x^2 - 41x - 7$

$$(6x+1)(x-7)$$

$\begin{array}{c} 1x \\ -42x \end{array}$

34.  $15x^2 - 25x - 10$

$$(3x+1)(5x-10)$$

## Take the Factoring Challenge

Factor each of the following, **completely**.

1.  $5x^2 + x - 18$

$$(5x - 9)(x + 2)$$

3.  $14x^2 + 19x - 3$

$$(7x - 1)(2x + 3)$$

5.  $b^2 + 5b - 24$

$$(b + 8)(b - 3)$$

7.  $8x^2 - 98y^2$

$$2(4x^2 - 49y^2)$$

$$\rightarrow 2(2x + 7y)(2x - 7y)$$

9.  $16x^2 - 8x + 1$

$$(4x - 1)(4x - 1)$$

11.  $9x^2 + 18x + 8$

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

13.  $3x^2 - 5x - 2$

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

15.  $20x^2 - 25x + 5$

$$5(4x^2 - 5x + 1)$$

$$5(4x - 1)(x - 1)$$

2.  $3x^2 - 27$

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

4.  $a^2 - 14a + 45$

$$(a - 9)(a - 5)$$

6.  $75x^2 - 147$

$$3(25x^2 - 49)$$

$$\rightarrow 3(5x + 7)(5x - 7)$$

8.  $2x^2 - 40x + 200$

$$2(x^2 - 20x + 100)$$

$$\rightarrow 2(x - 10)(x - 10)$$

10.  $x^2 - 8x + 15$

$$(x - 5)(x - 3)$$

12.  $15x^2 - 19x + 6$

$$(5x - 3)(3x - 2)$$

14.  $6x^2 - 33x + 15$

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

↑

16.  $18y^2 - 21y - 9$

$$3(6y^2 - 7y - 3)$$

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

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$$17. 10x^2 + 28x - 48$$

$$2(5x^2 + 14x - 24)$$

$$\rightarrow 2(5x-6)(x+4)$$

$$19. 4x^2 - 4x - 15$$

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

$$21. a^2 + 15a + 56$$

$$(a+7)(a+8)$$

$$23. 5x^4 - 80$$

$$5(x^4 - 16)$$

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

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

$$18. 5x^2 - 26x + 5$$

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

$$20. 6x^3 + 9x^2 - 15x$$

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

$$\rightarrow 3x(2x+5)(x-1)$$

$$22. 6x^2 - 28x - 48$$

$$2(3x^2 - 14x - 24)$$

$$\rightarrow 2(3x+4)(x-6)$$

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

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