

Name _____

Polynomials

Multiplying Binomials

Rule: $(a + b)(a - b) = a^2 - b^2$

Example: $(x - 2)(x + 2) = x^2 + 2x - 2x - 4 = x^2 - 4$

Use the FOIL method or DOTS rule to multiply the following binomials.

1. $(b - 7)(b + 7)$

$$b^2 - 49$$

2. $(5x + y)(5x - y)$

$$25x^2 - y^2$$

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

$$16a^2 - b^2$$

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

$$x^2 - 9$$

5. $(c + d)(c - d)$

$$c^2 - d^2$$

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

$$x^2 - 1$$

7. $(3b + 7)(3b - 7)$

$$9b^2 - 49$$

8. $(3x + y)(3x - y)$

$$9x^2 - y^2$$

9. $(2x^2 - y^2)(2x^2 + y^2)$

$$4x^4 - y^4$$

10. $(3x^2 - x)(3x^2 + x)$

$$9x^4 - x^2$$

11. $(8x^2 - 12)(8x^2 + 12)$

$$64x^4 - 144$$

12. $(2b^2 - 2)(2b^2 + 2)$

$$4b^4 - 4$$

13. $(3x + 2)(3x - 2)$

$$9x^2 - 4$$

14. $(12 + b)(12 - b)$

$$144 - b^2$$

15. $(x - y)(x + y)$

$$x^2 - y^2$$

16. $(x - yz)(x + yz)$

$$x^2 - y^2z^2$$

17. $(12b - 4)(12b + 4)$

$$144b^2 - 16$$

18. $(7x - 3y)(7x + 3y)$

$$49x^2 - 9y^2$$

19. $(-5x^3 + 3)(-5x^3 - 3)$

$$25x^6 - 9$$

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

$$x^4 - 64x^2$$

Products of Polynomials

$$2y(y - 5) = 2y^2 - 10y$$

Use the distributive property to multiply these polynomials.

1. $3x(x - 3)$

$$3x^2 - 9x$$

2. $2xy(2x - 3y)$

$$4x^2y - 6xy^2$$

3. $4a(2a + 4)$

$$8a^2 + 16a$$

4. $-5y^2(7y - 8y^3)$

$$-35y^3 + 40y^4$$

5. $-5ab(6a - 4b)$

$$-30a^2b + 20ab^2$$

6. $a(x + 1)$

$$ax + a$$

7. $y(y - 4)$

$$y^2 - 4y$$

8. $5b(3 - b)$

$$15b - 5b^2$$

9. $4x(x - 3)$

$$4x^2 - 12x$$

10. $4x^2(3x^2 - x)$

$$12x^4 - 4x^3$$

11. $-3x^2(4x^2 - 3x + 3)$

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

12. $5b(4b^3 - 6b^2 - 6)$

$$20b^4 - 30b^3 - 30b$$

13. $x(x^2 + x + x)$

$$x^3 + x^2 + x^2 = x^3 + 2x^2$$

14. $(3x^4 - 5x^2 - 4)(-3x^3)$

$$-9x^7 + 15x^5 + 12x^3$$

15. $3y(y^2 - 3y + 2)$

$$3y^3 - 9y^2 + 6y$$

16. $-4x^2(5 - 3x + 3x^2 + 4x^3)$

$$-20x^2 + 12x^3 - 12x^4 - 16x^5$$

17. $3b(4b^3 - 12b^2 - 7)$

$$12b^4 - 36b^3 - 21b$$

18. $-4x^2(3x^3 + 8x^2 + -9x)$

$$-12x^5 - 32x^4 + 36x^3$$

19. $(-9x^3)(3x^2 - 1)$

$$-27x^5 + 9x^3$$

20. $(3x^2 - 6x)(-x)$

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