NAME _____ DATE _____ PERIOD _____

8-8 Special Products *(Pages 458–463)*

In addition to the FOIL method, other shortcuts exist for finding special products of binomials.

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

Examples

a. Find $(s + 5)^2$.

Use the square of a sum rule.

$(a + b)^2 = a^2 + 2ab + b^2$
$(s + 5)^2 = (s)^2 + 2(s)(5) + (5)^2$
$= s^2 + 10s + 25$

b. Find $(3g - 8)^2$.

Use the square of a difference rule.

$(a - b)^2 = a^2 - 2ab + b^2$
$(3g - 8)^2 = (3g)^2 - 2(3g)(8) + (8)^2$
$= 9g^2 - 48g + 64$

c. Find $(4x + 7)(4x - 7)$.

Use the difference of squares rule.

$(a + b)(a - b) = a^2 - b^2$
$(4x + 7)(4x - 7) = (4x)^2 - (7)^2$
$= 16x^2 - 49$

d. Find $(6y + 9z^2)(6y - 9z^2)$

Use the difference of squares rule.

$(a + b)(a - b) = a^2 - b^2$
$(6y + 9z^2)(6y - 9z^2) = (6y)^2 - (9z^2)^2$
$= 36y^2 - 81z^4$

Practice

Find each product.

1. $(a + 9b)^2$

2. $(c - 5d)^2$

3. $(8m - n)^2$

4. $(7z + 7)(7z - 7)$

5. $(2g - h)(2g + h)$

6. $(8s + 8t)^2$

7. $(3u - 18v)^2$

8. $(6q + 0.4r)^2$

9. $(x^2 + y^3)^2$

10. $\left(\frac{1}{3}j^2 - k^2\right)^2$

11. $(8a^2 - 2d)(8a^2 + 2d)$

12. $(4n^2 + g^2)(4n^2 - g^2)$

13. $(6.2s + u^4)^2$

14. $(5 - b^7)(5 + b^7)$

15. $\left(\frac{3}{2}t^2 - r\right)\left(\frac{3}{2}t^2 + r\right)$

16. $\left(\frac{1}{4}c^2 - \frac{1}{3}k^3\right)^2$

17. $(2f + 1)(2f - 1)(f - 7)$

18. $(q - 2)(q + 9)(q + 2)(q - 9)$

19. **Standardized Test Practice** What is the product of $(x + 4)(x - 4)$?

A $x^2 - 8x - 16$ **B** $x^2 + 16$ **C** $x^2 - 16$ **D** $x^2 + 8x - 16$

Answers: **1.** $a^2 + 18ab + 81b^2$ **2.** $c^2 - 10cd + 25d^2$ **3.** $64m^2 - 16mn + n^2$ **4.** $49z^2 - 49$ **5.** $4g^2 - h^2$ **6.** $64s^2 + 128st + 64t^2$ **7.** $9u^2 - 108uv + 324v^2$ **8.** $36q^2 + 4.8qr + 0.16r^2$ **9.** $x^4 + 2x^2y^3 + y^6$ **10.** $\frac{1}{9}j^4 - \frac{2}{3}j^2k^2 + k^4$ **11.** $64a^4 - 4d^2$ **12.** $16n^4 - g^4$ **13.** $38.44s^2 + 12.4su^4 + u^8$ **14.** $25 - b^{14}$ **15.** $\frac{9}{4}t^4 - r^2$ **16.** $\frac{1}{16}c^4 - \frac{1}{6}c^2k^3 + \frac{1}{9}k^6$ **17.** $4f^3 - 28f^2 - f + 7$ **18.** $q^4 - 85q^2 + 324$ **19.** C