

9-8

NAME _____ DATE _____

Special Products (Pages 542–547)

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.

$$\begin{aligned}(a + b)^2 &= a^2 + 2ab + b^2 \\ (s + 5)^2 &= (s)^2 + 2(s)(5) + (5)^2 \\ &= s^2 + 10s + 25\end{aligned}$$

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

Use the square of a difference rule.

$$\begin{aligned}(a - b)^2 &= a^2 - 2ab + b^2 \\ (3g - 8)^2 &= (3g)^2 - 2(3g)(8) + (8)^2 \\ &= 9g^2 - 48g + 64\end{aligned}$$

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

Use the difference of squares rule.

$$\begin{aligned}(a + b)(a - b) &= a^2 - b^2 \\ (4x + 7)(4x - 7) &= (4x)^2 - (7)^2 \\ &= 16x^2 - 49\end{aligned}$$

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

Use the difference of squares rule.

$$\begin{aligned}(a + b)(a - b) &= a^2 - b^2 \\ (6y + 9z^2)(6y - 9z^2) &= (6y)^2 - (9z^2)^2 \\ &= 36y^2 - 81z^4\end{aligned}$$

PRACTICE

Find each product.

- $(a + 9b)^2$
- $(c - 5d)^2$
- $(8m - n)^2$
- $(7z + 7)(7z - 7)$
- $(2g - h)(2g + h)$
- $(8s + 8t)^2$
- $(3u - 18v)^2$
- $(6q + 0.4r)^2$
- $(x^2 + y^3)^2$
- $\left(\frac{1}{3}j^2 - k^2\right)^2$
- $(8a^2 - 2d)(8a^2 + 2d)$
- $(4n^2 + g^2)(4n^2 - g^2)$
- $(6.2s + u^4)^2$
- $(5 - b^7)(5 + b^7)$
- $\left(\frac{3}{2}t^2 - r\right)\left(\frac{3}{2}t^2 + r\right)$
- $\left(\frac{1}{4}c^2 - \frac{1}{3}k^3\right)^2$
- $(2f + 1)(2f - 1)(f - 7)$
- $(q - 2)(q + 9)(q + 2)(q - 9)$

**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. $4g^2 - 49$ 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. $\frac{9}{4}j^4 - \frac{3}{2}j^2k^2 + k^4$ 11. $64a^4 + 4a^2$ 12. $16m^4 - g^4$ 13. $38.44s^2 + 12.45u^4 + u^8$ 14. $25 - b^{14}$ 15. $\frac{7}{9}t^4 - r^2$ 16. $\frac{1}{16}c^4 - \frac{1}{3}c^2k^3 + \frac{1}{9}k^6$ 17. $4f^3 - 28f^2 - f + 7$ 18. $q^4 - 85q^2 + 324$ 19. C