

Section 7.3 Special Products of Polynomials

Core Concepts

Square of a Binomial Pattern

Algebra

$$(a + b)^2 = a^2 + 2ab + b^2$$

$$(a - b)^2 = a^2 - 2ab + b^2$$

Example

$$\begin{aligned}(x + 5)^2 &= (x)^2 + 2(x)(5) + (5)^2 \\ &= x^2 + 10x + 25\end{aligned}$$

$$\begin{aligned}(2x - 3)^2 &= (2x)^2 - 2(2x)(3) + (3)^2 \\ &= 4x^2 - 12x + 9\end{aligned}$$

Sum and Difference Pattern

Algebra

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

Example

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

Extra Practice

In Exercises 1-12, find the product.

1. $(a + 3)^2$ (write twice and FOIL) $(a+3)(a+3)$ $a^2 + 3a + 3a + 9$ $a^2 + 6a + 9$	2. $(b - 2)^2$	3. $(3x - 2)^2$
4. $(2a - 3b)^2$ (write twice and FOIL) $(2a-3b)(2a-3b)$ $4a^2 - 6ab - 6ab + 9b^2$ $4a^2 - 12ab + 9b^2$	5. $(-4c + 5d)^2$	6. $(-4p - 3)^2$

<p>7. $(x - 3)(x + 3)$ (FOIL)</p> $x^2 + 3x - 3x - 9$ $x^2 - 9$	<p>8. $(5a - 1)(5a + 1)$</p>	<p>9. $\left(\frac{1}{4}b + 1\right)\left(\frac{1}{4}b - 1\right)$</p>
<p>10. $(-m + 2n)(-m - 2n)$ (FOIL)</p> $m^2 + 2mn - 2mn - 4n^2$ $m^2 - 4n^2$	<p>11. $\left(\frac{1}{2}c + \frac{1}{3}\right)\left(\frac{1}{2}c - \frac{1}{3}\right)$</p>	<p>12. $\left(6a + \frac{1}{2}b\right)\left(-6a + \frac{1}{2}b\right)$</p>

~~13. Find k so that $kx^2 - 12x + 9$ is the square of a binomial.~~