Algebra 1 8.4

Find squares of sums and differences

Find the product of a sum and a difference

sum

difference

product

EWE

difference of squares

X-factor

$(x+5)^2 = (x+5)(x+5)$

$= x^2+10x+25$

$(\ )^2 + \text{double}(\ )^2$

EWE: look for patterns

$(x+5)^2 = (x+5)(x+5) = x^2+10x+25$

$(x+3)^2 = (x+3)(x+3) = x^2+6x+9$

$(x-10)^2 = (x-10)(x-10) = x^2+-20x+100$

$(x+8)^2 = (x+8)(x+8) = x^2+16x+64$

$(x-7)^2 = (x-7)(x-7) = x^2-14x+49$

$(x-6)^2 = (x-6)(x-6) = x^2-12x+36$

$(x+12)^2 = (x+12)(x+12) = x^2+24x+144$

$(x+9)^2 = x^2+18x+81$

EWE always!

a^2+4b^2

GuidedPractice

Find each product.

2A. $(6p-1)^2$

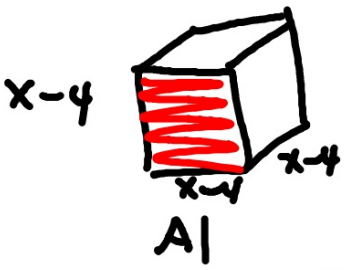
$$\begin{array}{r} 6p-1 \\ 6p-1 \\ \hline -6p \quad +1 \\ 36p^2 \quad -6p \\ \hline 36p^2-12p+1 \end{array}$$

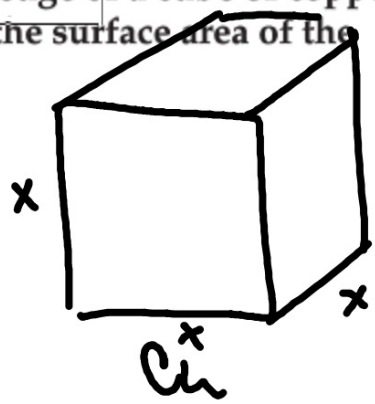
2B. $(a-2b)^2$

$$\begin{array}{r} a-2b \\ a-2b \\ \hline -2ab \quad +4b^2 \\ a^2 \quad -2ab \\ \hline a^2-4ab+4b^2 \end{array}$$

Real-World Example 3 Square of a Difference

PHYSICAL SCIENCE Each edge of a cube of aluminum is 4 centimeters less than each edge of a cube of copper. Write an equation to model the surface area of the aluminum cube.





$x-4$ by $x-4$ gives $x^2-8x+16$

$$\begin{array}{r} x-4 \\ \times\ x-4 \\ \hline -4x+16 \\ x^2-4x \\ \hline x^2-8x+16 \end{array}$$

$$6(x^2-8x+16)$$

$$6x^2-48x+96$$

GuidedPractice

3. GARDENING Alano has a garden that is g feet long and g feet wide. He wants to add 3 feet to the length and the width.

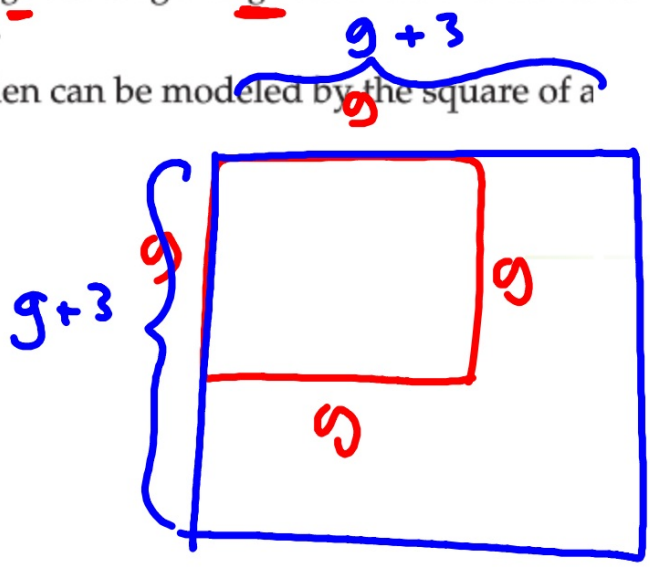
A. Show how the new area of the garden can be modeled by the square of a binomial.

B. Find the square of this binomial.

$A = (g+3)(g+3)$

$g+3$
$g+3$
$g^2 + 3g + 3g + 9$

$= g^2 + 6g + 9$



D.O.S.

Difference of squares: FWE look for a pattern

$(x + 5)(x - 5) = x^2 - 25$

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

$(x + 9)(x - 9) = x^2 - 81$

$x+3$
$x-3$

$x+5$
$x-5$

$-5x \quad -25$
$x^2 + 5x$

$x^2 - 25$

$x+9$
$x-9$

Example 4 Product of a Sum and a Difference

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

$2x^2 + 3$

$2x^2 - 3$

$-6x^2 - 9$

$4x^4 + 6x^2$

$4x^4 - 9$

GuidedPractice

Find each product.

4A. $(3n + 2)(3n - 2)$

$3n + 2$

$3n - 2$

$-6n \quad -4$

$9n^2 + 6n$

4B. $(4c - 7d)(4c + 7d)$

$4c+7d$

$4c-7d$

$-28cd - 49d^2$

$16c^2 + 28cd$

$16c^2 - 49d^2$