



# Multiplying Expressions

Let's explore multiplication strategies.

## 8.1

## Worked Example: Multiplying Binomials

Rewrite 5 and 15 as binomials, and multiply the binomials, using a diagram.

Step 1:  $5 = 10 - 5$  and  $15 = 10 + 5$ , so  $5 \cdot 15 = (10 - 5) \cdot (10 + 5)$

Step 2:

	10	-5
10		
5		

Step 3:

	10	-5
10	100	-50
5	50	-25

Step 4:  $100 - 50 + 50 - 25 = 75$

## 8.2 A Method for Multiplying

Here is a method for multiplying 97 and 103:

97 is  $100 - 3$

103 is  $100 + 3$

So  $97 \cdot 103 = (100 - 3)(100 + 3)$

	100	-3
100	10,000	-300
3	300	-9

1. Explain how this diagram is used to compute  $97 \cdot 103 = 9,991$ .
2. Draw a similar diagram that helps you mentally compute  $(30 + 1)(30 - 1)$ . What is the result? What multiplication problem did you just solve?
3. Use this method to compute:
  - a.  $7 \cdot 13$
  - b.  $102 \cdot 98$
  - c.  $995 \cdot 1,005$

## 8.3

## Find the Missing Pieces

Complete each diagram. Write some equivalent expressions based on the diagram.

1.

		7
10		
-7	-70	

2.

	$x$	8
$x$		
-8		

3.

	$a$	-9
		$-9a$
9		

4.

	$b$	$\frac{1}{2}$
$b$	$b^2$	
		$-\frac{1}{4}$

5.

	7	
$c$		$-c^2$
7	49	