Unit 8, Lesson 8

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

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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	