## Lesson 8: Multiplying Expressions

* Let’s explore multiplication strategies.

### 8.1: Math Talk: Combining the Similar Numbers

Evaluate mentally.

$100⋅100$

$-3⋅3$

$-300+300$

$1,​279+-1,​279$

### 8.2: A Method for Multiplying

Here is a method for multiplying 97 and 103:

97 is $100−3$

103 is $100+3$

So $97⋅103=\left(100−3\right)\left(100+3\right)$

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

1. Explain how this diagram is used to compute $97⋅103=9,​991$.
2. Draw a similar diagram that helps you mentally compute $\left(30+1\right)\left(30−1\right)$. What is the result? What multiplication problem did you just solve?
3. Use this method to compute:
	1. $7⋅13$
	2. $102⋅98$
	3. $995⋅1,​005$
4. Create a challenge problem for your partner, that could use this method. Create a diagram that shows the answer before giving the problem to your partner.

### 8.3: Find the Missing Pieces

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

|  |  |  |
| --- | --- | --- |
|  | 1. 10
 | * 5
 |
| * 10
 | * 100
 |  |
|  |  | * 45
 |

|  |  |  |
| --- | --- | --- |
|  |  | 1. 7
 |
| * 10
 |  |  |
| * -7
 | * -70
 |  |

|  |  |  |
| --- | --- | --- |
|  | 1. $x$
 | * 8
 |
| * $x$
 |  |  |
| * -8
 |  |  |

|  |  |  |
| --- | --- | --- |
|  | 1. $a$
 | * -9
 |
|  |  | * $-9a$
 |
| * 9
 |  |  |

|  |  |  |
| --- | --- | --- |
|  | 1. $b$
 | * $\frac{1}{2}$
 |
| * $b$
 | * $b^{2}$
 |  |
|  |  | * $-\frac{1}{4}$
 |

|  |  |  |
| --- | --- | --- |
|  | 1. 7
 |  |
| * $c$
 |  | * $-c^{2}$
 |
| * 7
 | * 49
 |  |



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