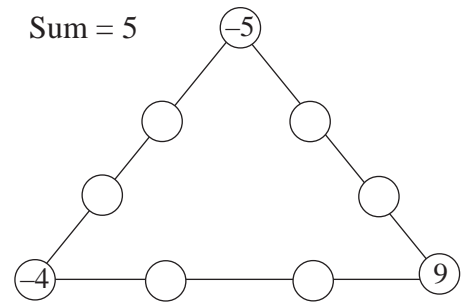
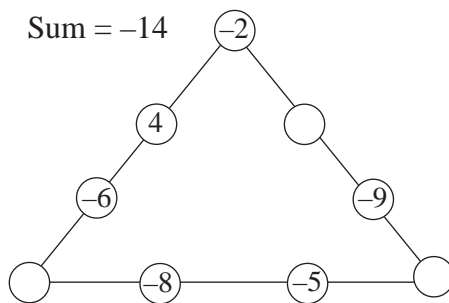


# Is It Really Magic?

## Adding and Subtracting Integers

The puzzles below are called “Magic” puzzles. Is there really anything magic about them? Solve them for yourself and see!

The sum of the numbers along each side of each of the magic triangles below are given. Use your calculator and integers to solve both triangles.



Each of the two magic squares below have the same sum horizontally, vertically, and diagonally. Use your calculator and integers to solve both squares.

9	<input type="text"/>	<input type="text"/>
-6	0	<input type="text"/>
<input type="text"/>	<input type="text"/>	-9

<input type="text"/>	-10	<input type="text"/>
<input type="text"/>	-5	<input type="text"/>
-1	<input type="text"/>	-14

### Thinking Cap



Is there more than one way to solve any of the 4 magic puzzles above? Explain your answer?

# Is It Really Magic?

## Adding and Subtracting Integers

**Topic:** Adding and Subtracting Integers

**Objective:** To use the calculator to solve puzzles involving adding and subtracting integers.

**NCTM Standards:** Problem Solving, Communication, Reasoning, Computation and Estimation

### Using the Activity

Students use the calculator in this activity to add and subtract integers to solve puzzles.

- The **+/-** can be used to enter an integer.
- The **M+** and **MR** keys can be used to enter the necessary sums into the memory of the calculator.

**Example** To solve the first magic triangle, find the sum of the integers in the first three circles.

Then store the sum in memory and subtract it from  $-14$ . The difference is the integer that should be placed in the bottom left hand circle of the triangle. 2 **+/-** **+** 4 **+**

6 **+/-** **=**  $-4$  **M+** 14 **+/-** **-** **MR** **=**  $-10$ . To find the integer for the bottom right hand circle, enter 10 **+/-** **+** 8 **+/-** **+** 5 **+/-** **=**  $-23$  **M+** 14 **+/-** **-** **MR** **=** 9.

To find the integer for the remaining circle in the triangle, enter 9 **+** 9 **+/-** **+** 2 **+/-** **=**  $-2$  **M+** 14 **+/-** **-** **MR** **=**  $-12$ .

**Assessment** Have students use the calculator to add the integers in each completed magic puzzle to check to be sure the sums are the same.

### Answer

*First magic triangle: Starting in the bottom left hand corner and moving counterclockwise, the integers are  $-10$ , 9, and  $-12$ .*

*Second magic triangle: Starting on the left hand side and moving counterclockwise, one possible solution is 6,  $-6$ , 8,  $-7$ , 8, and 6.*

*First magic square: Sum: 0; First row:  $-12$ , 3; Second row: 6; Third row:  $-3$ , 12*

*Second magic square: Sum:  $-15$ ; First row: 4,  $-9$ ; Second row:  $-18$ , 8; Third row: 0*

### Thinking Cap

Students are asked to determine whether there could possibly be other solutions to the magic puzzles. They may want to think about this question while they are actually solving the puzzles.

### Answers

*There is only one way to solve the first magic triangle and the two magic squares.*

*There is more than one way to solve the second magic triangle. Many choices of integers can be used to get a sum of 5.*