

## STUDENT PROBLEM CORNER

Students are encouraged to examine the problems presented below.  
Send your explanation or solution to:

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Delta-K will publish the names of students who successfully solve the problems.

# Finding the Sum of Circled Numbers: Magic and Mathematics

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Editor

*NOTE: The following problem is suitable for students at the junior high school level.*

Many tricks of magic have a mathematical basis. The magician uses knowledge of algebra to astound the audience.

Discuss the following directions and the result with your friends to determine the algebraic basis the magician used to determine the sum of the circled numbers.

### Instructions

1. The magician hands a calendar and a pair of scissors to a member of the audience and asks that person to cut a four-by-four array of numbers from one month of the calendar.

The magician states that he is not to see the four-by-four array.

2. The array is then passed to a second member of the audience, who has previously been given a "magic" marker. The magician asks the second person to circle one number only, and then to cross out the numbers in the row and column in which the circled number appears.

While these instructions are being completed, the magician retrieves the rest of the calendar page, crumples it, and tosses the remains into a waste basket.

- The array is now passed to a third person, and the instructions given in item #2 above are repeated. No number that has a line through it may be circled.

Again, the magician repeats that he is not to see the circled numbers or those that are crossed out. He turns his back to the audience.

- Now the array is passed to a fourth person, and directions given in item #2 are repeated once again.

The magician writes something on an acetate sheet that is to be used on an overhead projector.

- The array is now passed to a fifth member of the audience, who verifies that only one number remains which is not circled and does not have a line through it. This number is then circled.

- The array is passed to a sixth person, who determines the sum of the four circled numbers.

The magician moves to the overhead projector.

- As the sixth person states the sum, the magician turns on the overhead projector. The sum given orally is the same as the numeral which appears on the screen.

## Your Challenge

How did the magician know the sum?

A clue is provided. The piece of paper that was crumpled and discarded is reproduced below.

F E B R U A R Y 1 9 8 6

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1
2					7	8
9			THIS IS THE		14	15
16			FOUR-BY-FOUR ARRAY		21	22
23					28	

# Variation of a Problem

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*NOTE: The following problem is suitable for students at the upper elementary and junior high school levels.*

One hundred (100) cows were in a farmer's pasture. Suddenly, a spaceship appeared, zapped the herd with a space ray, and changed some of the cows into gigantic spiders. A battle ensued, with cows killing spiders and spiders killing cows. All the bodies of the spiders and cows were disintegrated. The legs were left intact. The last animal self-destructed, leaving only the legs.

In the morning, the farmer found nothing but cows' or spiders' legs. He collected 500 legs.

How many cows were turned into giant spiders?

## HELP!

We need articles for *The Canadian Mathematics Teacher*. This is your publication, and it is only as good as the members want to make it. Please let us share activities or methods you have found to be successful in your class. Provide the ideas, and we will put them in final form for publication. Handwritten copies are acceptable. Send your ideas to your *Delta-K* editor.

Let's hear from you!