Slicing Circles
One line separates a circle into 2 sections.

Two lines can separate a circle into four sections.

What is the maximum number of sections that can be formed by:
- 4 lines drawn through a circle?
- 5 lines drawn through a circle?

Take the PRIME MATHgazine Junior Challenge! Solve the problems and send in your solutions for a chance to become the GREAT STEMATICIAN OF 2014. Awards in July 2014.
Submissions for this issue are due November 30, 2013.

3 ways to submit:
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Reducing Rectangles

The dimensions of Rectangle A are 30 cm by 60 cm.

1. Suppose that each dimension of Rectangle A is reduced by 20% to create Rectangle B. The area of Rectangle B is what percent of the area of Rectangle A?

2. Suppose that each dimension of Rectangle A is reduced by 50% to create Rectangle C. The area of Rectangle C is what percent of the area of Rectangle A?

Dozen Doozer!

1. What are five numbers 100 or less that have exactly 12 factors?
2. What is the least 3-digit number for which 12 is a factor?
3. What is the greatest 3-digit number for which 12 is a factor?

Perplexing Patterns

| A | B | C | D | E | A | B | C | D | E | A | B | C | D | E | A | B | C | D | E | A | B |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |

The letter pattern continues.

1. What letter is above:
   - 92?
   - 149?

2. In the first 120 letters, how many letters are:
   - A’s?
   - Vowels?
   - Consonants?
Pizzeria Perplexeria

Which cheese pizza is the best buy?

The best buy is the ______ inch cheese pizza because __________.

(size)

Flip It Forecast

You have a quarter, a dime, a nickel, and a penny.

You toss all four coins at the same time. What is the probability that

1. Two coins will show heads and two will show tails?
2. All four coins will show tails?

Chances Are

What is the probability that a randomly chosen 3-digit number between

1. 100 and 200 is divisible by one of its digits?
2. 200 and 300 is divisible by one of its digits?
Balzano is a puzzle that will tap into your logical reasoning abilities. Read the directions carefully. Then try your hand at Balzano Shapes.

**Directions:**

Your job is to figure out the Desired Arrangement (the solution) of three or more shapes from clues that provide information about the shapes and their locations. The possible shapes are triangle, rhombus, trapezoid and circle. No shapes are repeated.

The **Arrangement Column** shows sets of shapes in rows. In the Balzano puzzle below, the second row in order from left to right is: trapezoid, circle, triangle.

**Correct Shape in the Correct Place** identifies the number of shapes that are in the Desired Arrangement AND in the right place. The second row has no shape that is in the Desired Arrangement and in the right place.

**Correct Shape in the Wrong Place** identifies the number of shapes in the Desired Arrangement that are the right shapes BUT in the wrong place. There are 2 of these in the second row.

**Incorrect Color** identifies the number of shapes that are NOT in the Desired Arrangement. There is one of these in the second row.

<table>
<thead>
<tr>
<th>Arrangement</th>
<th>Correct Shape in Correct Place</th>
<th>Correct Shape in Wrong Place</th>
<th>Incorrect Shape</th>
</tr>
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<tbody>
<tr>
<td>□ △ ○</td>
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