

Boise State University, Department of Mathematics

May 2013

# MATH PROBLEM SOLVING COMPETITION

## Angles, Area and Perimeter.

Consider a triangle with side lengths  $a, b, c$  and angles  $\alpha, \beta, \gamma$ . Show that

$$\tan\left(\frac{\alpha}{2}\right) \cdot \tan\left(\frac{\beta}{2}\right) \cdot \tan\left(\frac{\gamma}{2}\right) = \frac{A}{s^2},$$

where  $A$  is the area and  $s = \frac{a+b+c}{2}$  is the semi-perimeter of the triangle.

(Thanks Jaimos F. Skriletz for the problem!)

## How many months has the year?

On planet *Esboi* the year has - just as on earth - 365 days. Also on this planet each month has 28, 30 or 31 days. Show that on planet *Esboi* the year also must have 12 months.

**Drop your solutions in the Department's Office  
before May 16, Attn: Uwe Kaiser**

**Be the month's winner and get a certificate!**