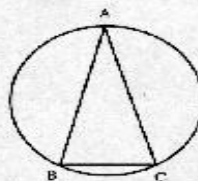


## MATH AWARENESS MONTH COMPETITION

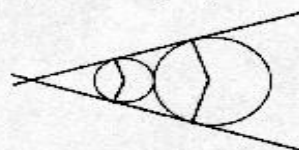
### 2000 Examination for 10th-12th Grades

**DIRECTIONS:** [40 Minutes - 5 Questions] Start each new problem on a separate page. Show your work! Answers must be exact. You are allowed to use a calculator. You are not allowed to borrow or interchange calculators during the test.

1. Triangle  $ABC$  is inscribed in a circle, and  $\angle B = \angle C = 4\angle A$ .  $B$  and  $C$  are adjacent vertices of a regular polygon of a  $n$  sides inscribed in this circle. Find  $n$ .



2. If  $\log_8 a + \log_4 b^2 = 5$  and  $\log_8 b + \log_4 a^2 = 7$ , find  $ab$ .
3. An urn contains 16 balls of two colors, red and blue. Four balls are drawn from the urn without replacement. The probability of getting exactly 2 red and 2 blue balls is  $\frac{1}{20}$ . The urn contains more red than blue balls. How many blue balls were originally in the urn?
4. Two circles sit in the wedge  $y = \pm \frac{x}{3}$  as shown. The radius of the inner, smaller circle is 1. The radius of the outer circle is  $R$ . Find  $R$ .



5. If  $\sec x + \tan x = \frac{17}{7}$ , find  $\csc x + \cot x$ .