Bergen County Mathematics League

Good Luck To You

Good Luck To All

Contest #3 (No Calculators) **2015-2016**

Part I *Time Limit:* 12 *minutes* On contests #4 and #6, ***any S.A.T. calculator will be allowed.***

3-1. When rounding the irrational number x to the nearest hundredth, we get 20.15. What is the maximum value we can get when we round x to the nearest thousandth?

3-2. What is the sum of the reciprocals of two real numbers whose sum is 14 and whose product is 4?

Part II *Time Limit:* 12 *minutes*

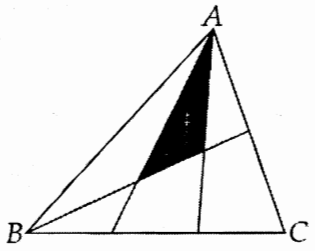
3-3. If the measures of angles in $\triangle ABC$ satisfy $m\angle B - m\angle A = m\angle C - m\angle B$, what is $m\angle B$?

3-4. What ordered pair of positive integers (a, b) satisfies $\sqrt{163 - 56\sqrt{3}} = a\sqrt{3} - b$?

Part III *Time Limit:* 12 *minutes*

3-5. The right side of the equation $AB \times A \times B = BBB$ represents a 3-digit number with 3 identical digits. The left side represents the product of three factors: the two-digit number AB, the digit A, and the digit B. If different letters represent different digits, what is the ordered pair of nonzero digits (A, B)?

3-6. As shown at the right, $\triangle ABC$ has area 180. Two line segments are drawn from A to the trisection points of $\overline{BC}$, and a line segment is drawn from B to the midpoint of $\overline{AC}$. What is the area of the shaded triangular region?



Answers

3-1. 20.155

3-2. 7/2

3-3. 60 or 60°

3-4. (7, 4)

3-5. (3, 7)

3-6. 27