



Contest #3 Bergen County Math League 2018–2019

Part I *Time Limit:* 12 minutes

Calculators Allowed

Answers must be exact or have 4 (or more) significant digits, correctly rounded.

- 3–1. Find the least positive integer n for which $n^2 + 4n + 36$ is an integral multiple of 32.
- 3–2. Triangle ABC is inscribed in a circle. The degree-measure of $\angle A$ is $\frac{1}{3}$ the degree-measure of \widehat{CAB} . Find $m\angle A$.
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Part II *Time Limit:* 12 minutes

Calculators Allowed

Answers must be exact or have 4 (or more) significant digits, correctly rounded.

- 3–3. The sum of the squares of x and y is A . The square of the sum of x and y is B . Find the value of xy in terms of A and B .
- 3–4. In a regular polygon of n sides, the measure of each interior angle is 100 more than the measure of each exterior angle. Find n .
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Part III *Time Limit:* 12 minutes

Calculators Allowed

Answers must be exact or have 4 (or more) significant digits, correctly rounded.

- 3–5. The sum of the ages of Ace, Flash, and Speedy is 73. When Ace will be twice as old as Speedy, the sum of their two age will be 132. Write an *equation* expressing Flash's present age, f , explicitly in terms of Speedy's present age, s .
- 3–6. Find all five-digit numbers (in base-ten notation, with the leftmost digit non-zero) in which each digit is greater than the sum of the digits to its right.
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Answers

- 3–1. 30
- 3–2. 72 or 72°
- 3–3. $\frac{B-A}{2}$
- 3–4. 9
- 3–5. $f = 29 - 2s$
- 3–6. 84210, 94210, 95210