

Bergen County Math League

Calculators Permitted

Good Luck to You



Good Luck to All

Contest #1

2024-2025 12 minutes

Questions 1 & 2

1-1. The area of an isosceles trapezoid is numerically 12 times the length of the shorter base. The longer base is 3 times as long as the shorter base. Find the length of an altitude (between the bases) of the trapezoid.

1-2. The roots of the equation

$$x^2 + (1 - m)x + n = 0$$

are $m + 1$ and $n - 1$. Find the numerical value of n .

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Questions 3 & 4

- 1-3. Find the ordered triple (a, b, c) which satisfies

$$(a + 4b)x^2 + (4b + 3c)x + (3c + a) = 5x^2 + 7$$

for all values of x .

- 1-4. Bill can complete a job alone in 4 days. When his son “helps,” it takes 5 days for the two of them to complete the same job. If Carl can complete this same job alone in 10 days, how many days would it take Carl to complete the job with the “help” of Bill’s son?

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Questions 5 & 6

- 1-5. In $\triangle ABC$, D is the point on \overline{BC} , between B and C , for which $AD = BD$ and $CD = AC$.
If $m\angle CAB = 60$, find $m\angle ACB$.
- 1-6. If 25607 and 101215 are, respectively, the base-nine and base- x numerals for the same number, find the positive integer x . Express your answer as a base-ten numeral.