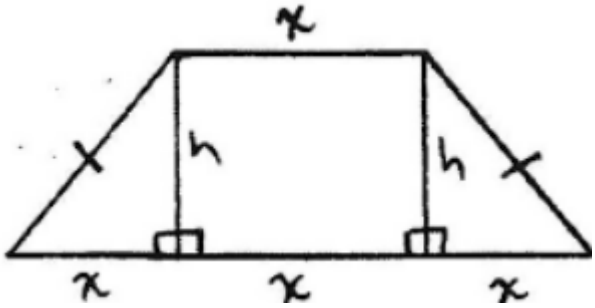
Bergen County Math League
Calculators Permitted

Contest #1 **2024-2025** **Answers/Solutions**

1-1. **Answer:** 6



$(2x)(h) = 12x \Rightarrow h = 6$

1-2. **Answer:** -1

Sum of the roots = $m + n = -(1 - m)$, so $n = -1$.

1-3. **Answer:** $\left(6, -\frac{1}{4}, \frac{1}{3}\right)$

Equate coefficients: $\begin{cases} a + 4b = 5 \\ 4b + 3c = 0 \\ a + 3c = 7 \end{cases} \Rightarrow (a, b, c) = \left(6, -\frac{1}{4}, \frac{1}{3}\right)$

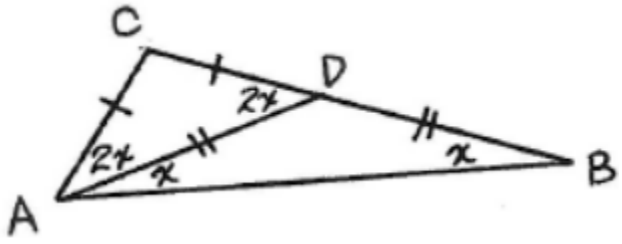
1-4. **Answer:** 20

$$\frac{5}{4} + \frac{5}{x} = 1 \Rightarrow x = -20$$

$$\frac{y}{10} + \frac{y}{-20} = 1 \Rightarrow y = 20$$

1-5. **Answer:** 100

Letting angle B have degree-measure x, angle ADC, an exterior angle of triangle ADB, has degree measure $2x$. The diagram indicates that the measure of angle $CAB = 3x = 60$. Thus, $x = 20$, and m$\angle ACB = 100$.



1-6. **Answer:** 7

101215 contains more digits than 25607, so the base must be less than nine, and it uses the digit 5, so the base must be at least 6, leaving only 6, 7, and 8 as possibilities. Since 25607_9 is even and 101215 is odd if base is even, but is even if base is odd, the answer must be the odd base, namely 7.

Alternatively, one need only try the middle choice. If this is incorrect, one will know immediately if it is too large or too small a choice for the base.