



Contest #4 Bergen County Math League 2018–2019

Part I *Time Limit:* 12 minutes

No Calculators

- 4-1. The coordinates of the midpoints of two adjacent sides of a square are $(-1, 0)$ and $(2, 3)$. Find the area of the square.
- 4-2. Express the fourth root of $8^{10} + 8^{10} + 8^{10} + 8^{10}$ as a base-ten numeral.
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Part II *Time Limit:* 12 minutes

No Calculators

- 4-3. A fish consists of a head, a body, and a tail. The head is 9 cm long. The tail is as long as the head plus half the body. The body is as long as the head plus the tail. Find the length of the whole fish, in cm.
- 4-4. If $\log_{10}(\log_{10}(\log_{10}(\log_{10} x))) = 0$, then $x = 10^k$. Find k .
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Part III *Time Limit:* 12 minutes

No Calculators

- 4-5. The sum of the digits of the positive integer n is the cube root of n . If n is a three-digit number, find n .
- 4-6. In right triangle ABC , the length of the hypotenuse \overline{AB} is 25, and the length of altitude \overline{CD} is 12. Square $CEFG$ has E on \overline{AC} , F on \overline{AB} , and G on \overline{BC} . Find EC .
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Answers

- 4-1. 36
- 4-2. 256
- 4-3. 72 or 72 cm
- 4-4. 10^{10}
- 4-5. 512
- 4-6. $\frac{60}{7}$