



Contest #2 Bergen County Math League 2019–2020

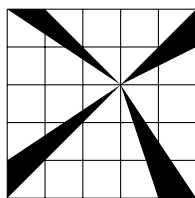
Part I *Time Limit:* 12 minutes

No Calculators

- 2-1. Find the degree measure of the central angle of an arc such that the length of the arc is equal to the radius of the circle.
- 2-2. If $27x^6 + 108x^5 + 90x^4 - 80x^3 - 60x^2 + 48x - 8$ is a perfect cube, find its cube root (in terms of x).
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Part II *Time Limit:* 12 minutes

No Calculators



The figure is at left composed of 25 unit squares. What is the area of the unshaded region?

- 2-3.
- 2-4. Find the ordered pair (x, y) for which $x^3 + xy^2 = 10$ and $y^3 + yx^2 = 20$.
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Part III *Time Limit:* 12 minutes

No Calculators

- 2-5. Find the value of x which satisfies $8^x + 8^{x+1} = 144$.
- 2-6. Two hundred stones are placed on the ground 3 feet apart, the first being 3 feet from a basket. If the basket and all the stones are in a straight line, how many feet does a person travel who starts from the basket and brings all the stones to it one by one?
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Answers

- 2-1. $\frac{180}{\pi}$ or exact equivalent
- 2-2. $3x^2 + 4x - 2$
- 2-3. 20
- 2-4. $(\sqrt[3]{2}, 2\sqrt[3]{2})$
- 2-5. $\frac{4}{3}$
- 2-6. 120600 (feet)