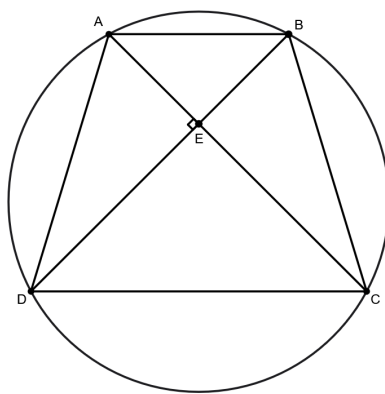


# NC(SMC)<sup>2</sup> 2025 Accuracy Round

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May 10th, 2025

1. In a 100-meter race, the tortoise raced at 1 meter per second, while the hare raced at 4 meters per second. During the race, the hare took a nap. If they both began and finished at the same time, for how long in seconds did the hare nap?
2. What integer is closest in value to  $\frac{5^4}{3^4-2^4}$ ?
3. I can paint 5 walls in 2 hours, Jonathan can paint 5 walls in 1.5 hours, and Noah can paint 5 walls in 3 hours. How many minutes does our combined effort take to paint 10 walls?
4. Avery has 3 shirts - colored red, white, and blue, 5 pants - red, blue, green, purple, and white, 2 pairs of shoes - white and black. If he randomly chooses one shirt, one pants, and one pair of shoes, the probability that Avery wears at least 2 different colors can be written as  $\frac{a}{b}$  for relatively prime integers  $a$  and  $b$ . What is  $a$ ?
5. A trapezoid  $ABCD$  is inscribed in a circle and has perpendicular diagonals that meet at point  $E$ . If  $AE = 3$  and  $DE = 7$ , find the area of the trapezoid.



6. The sum  $\frac{1}{2} + \frac{2}{3} + \cdots + \frac{99}{100} + \frac{100}{99} + \cdots + \frac{3}{2} + \frac{2}{1}$  can be written as the fraction  $\frac{m}{n}$ , where  $m$  and  $n$  are relatively prime integers. What is  $m + n$ ?

7. A cube of side length 1 is inscribed in a triangular prism of volume 4. If a similar triangular prism contains a cube with side length 3 inscribed in the same way, what is the volume of the larger prism?
8. Anushka's shadow is 44 inches long. After standing on 12 inch stilts, her shadow is now 52 inches long. How tall is Anushka in inches?
9. A palindrome is a number that remains the same when its digits are reversed. Find the smallest positive integer  $n$  such that both  $n$  and  $n + 2025$  are palindromes.
10.  $305 + 174\sqrt{3}$  can be represented as  $(a + \sqrt{b})^3$ , where  $a$  and  $b$  are positive integers. Compute  $100a + b$ .