

SJA MATHEMATICS CONTEST I

Intermediate Division Sample Questions

1. The product of three consecutive integers is 504. Find the smallest number among the three integers.

- (A) 7 (B) 9 (C) 11 (D) 13 (E) 15

2. The figure below shows a running track. It takes $4 + \pi$ seconds for Hilly to complete one lap along the outer track with a speed of 10 meters per second. Besides, it takes $10 + 2\pi$ seconds for Hilly to complete one lap along the inner track with a speed of 4 meters per second. If the radius of the two semicircles and the horizontal length of the track are both integers, find the area of the shaded regions.



- (A) $20m^2$ (B) $40m^2$ (C) $60m^2$ (D) $80m^2$ (E) $100m^2$

3. Hilly chooses three distinct integers from the interval $[1,5]$. What is the probability that the set of three integers can form a triangle when each value is assigned as the side length?

- (A) $\frac{1}{2}$ (B) $\frac{1}{10}$ (C) $\frac{3}{10}$ (D) $\frac{5}{10}$ (E) $\frac{7}{10}$