BRITISH COLUMBIA SECONDARY SCHOOL MATHEMATICS CONTEST, 2009

Junior Final, Part A

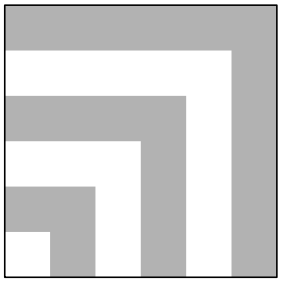
Friday May 8

Dedicated to the memory of Jim Totten, the inspiration for and co-founder of the BCSSMC

1. In the game of Wombat the only scores are "gribbles" and "binks". Each "gribble" earns 4 points and each "bink" earns 5. The highest score that **cannot** be obtained is:

   (A) 11 (B) 13 (C) 17 (D) 21 (E) 23

2. The gray and white strips in the target shown in the figure have equal width. A dart is thrown at the target where it sticks at a random location. The probability that the dart sticks in a gray strip is:



   (A) $\frac{3}{5}$ (B) $\frac{1}{2}$ (C) $\frac{19}{36}$ (D) $\frac{5}{9}$ (E) $\frac{7}{12}$

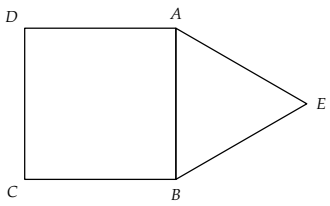
3. Jennifer has 21 coins consisting of dimes and quarters. If the dimes were quarters and the quarters were dimes, she would have \$1.05 less than she has now. Subtracting the number of dimes from the number of quarters gives:

   (A) 1 (B) 3 (C) 5 (D) 7 (E) 9

4. Antonino can run around a track in 5 minutes while Bill runs around the same track in 9 minutes. If Antonino and Bill start together, running in the same direction, the number of minutes it will take Antonino to gain one lap on Bill is:

   (A) 10 (B) $10\frac{1}{4}$ (C) $10\frac{3}{4}$ (D) $11\frac{1}{4}$ (E) $11\frac{1}{2}$

5. In the figure, $ABCD$ is a square and ABE is an equilateral triangle. The measure of angle AED, in degrees, is:



   (A) 10 (B) 15 (C) 18 (D) 20 (E) 30

6. The symbols Δ, Φ, Ψ, and $\odot$ represent integers. The sum of the values in each row and three of the columns is given. The value of $\Delta + \odot$ is:

Δ	Φ	Φ	Φ	11
Δ	$\odot$	$\odot$	Φ	13
$\odot$	$\odot$	Δ	Δ	16
Φ	Ψ	Ψ	Ψ	14
15	12	14		

   (A) 3 (B) 5 (C) 8 (D) 9 (E) 10

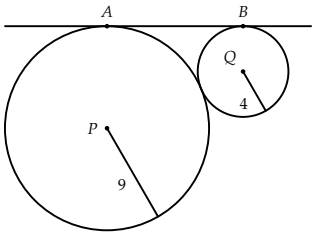
7. The radius of the largest circle contained in a triangle with sides 3, 4, and 5 is:

   (A) 1 (B) $\frac{3}{2}$ (C) 2 (D) $\frac{12}{5}$ (E) $\frac{4}{5}$

8. If $2009 = a^b \times c$, where a, b, and c are all prime then the value of $\sqrt{\frac{a+b+c}{b}}$ is:

   (A) 2 (B) 4 (C) 5 (D) 6 (E) 7

9. Circles with centres at P and Q are tangent. The radius of the larger circle is 9 units and that of the smaller circle 4 units. The length of the common tangent $\overline{AB}$ is:



   (A) 9 (B) 10 (C) 11

   (D) 12 (E) 13

10. A 6 cm $\times$ 12 cm $\times$ 22 cm rectangular block of wood is painted red and then cut into small cubes, each of which has a surface area of 6 cm^2. The number of small cubes that have red paint on exactly two faces is:

    (A) 136 (B) 144 (C) 152 (D) 156 (E) 160