

**BRITISH COLUMBIA SECONDARY SCHOOL
MATHEMATICS CONTEST, 2011**

Junior Preliminary

Wednesday, March 30

1. Among the following fractions the largest is:

(A) $\frac{1}{3}$ (B) $\frac{2}{5}$ (C) $\frac{11}{30}$ (D) $\frac{5}{12}$ (E) $\frac{7}{20}$

2. Starting from the same point at the same time Antonino and Boris run around a circular track that is 1 km long. If Antonino runs at 3.5 km/hr and Boris runs at 4 km/hr and they agree to keep running until they are again at the starting point at the same time, the number of hours they will need to run is:

(A) $\frac{1}{2}$ (B) 1 (C) $1\frac{1}{2}$ (D) 2 (E) 7

3. Some playing cards from an ordinary deck of 52 cards are arranged in a row. To the right of some King is at least one Queen. To the left of some Queen is at least one other Queen. To the left of some Heart is at least one Spade. To the right of some Spade is at least one other Spade. The minimum number of cards in this row is:

(A) 2 (B) 3 (C) 4 (D) 5 (E) 6

4. It takes 255 digits to number the pages of a book: 1, 2, 3, The number of pages that the book contains is:

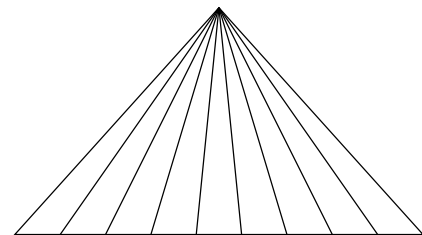
(A) 111 (B) 121 (C) 122 (D) 211 (E) 212

5. A large cube is formed by gluing together 27 smaller identical cubes. Each of the smaller cubes is painted either all black or all white. The large cube is formed in such a way that no two faces of the same colour are adjacent to each other. If at least one of the six corner cubes is painted black, the total number of the 26 outside cubes that are painted black is:

(A) 12 (B) 13 (C) 14 (D) 16 (E) 18

6. A cevian is a line segment that joins one vertex of a triangle and a point, other than a vertex, on the opposite side. If eight cevians are drawn from one vertex of a triangle (as shown in the diagram), the number of triangles formed, counting the original triangle, is:

(A) 9 (B) 28 (C) 36
(D) 45 (E) 90



7. When the sum of a certain set of numbers is doubled, the result is 5248. If one of the numbers is changed from 213 to 312, then twice the sum of the new numbers is:

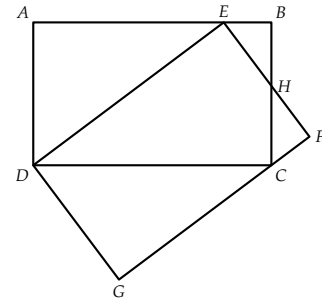
(A) 5347 (B) 5247 (C) 5560 (D) 5577 (E) 5446

8. A jar contains 52 dollars in quarters, one dollar coins, and two dollar coins. If there are 48 coins in the jar and the number of one dollar coins is three times the number of two dollar coins, then the number of quarters in the jar is:

(A) 8 (B) 9 (C) 12 (D) 14 (E) 16

9. $ABCD$ and $DEFG$ are rectangles with $\overline{AB} = \overline{DE} = 15$ and $\overline{BC} = \overline{EF} = 9$. The point E lies on the segment AB , and segment EF intersects BC at H . The area of quadrilateral $DEHC$ is:

(A) 60 (B) 66 (C) 72
(D) 75 (E) 81



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

(A) 1 (B) $\frac{5}{12}$ (C) 2 (D) $\frac{7}{5}$ (E) $\frac{4}{5}$

11. The number of nonnegative integers n for which $\frac{12}{n-3}$ is an integer is:

(A) 4 (B) 6 (C) 9 (D) 10 (E) 12

12. Two numbers are removed from the set $\{1, 2, 3, 4, 5, 6, 7, 8\}$. The remaining numbers are added to obtain a sum, and the digits of this sum are added to obtain the number N . If $N = 10$, the sum of the numbers removed is:

(A) 3 (B) 4 (C) 5 (D) 6 (E) 8