BRITISH COLUMBIA SECONDARY SCHOOL MATHEMATICS CONTEST, 2016

Junior Preliminary

Wednesday, April 6

1. Which of the following is *not* a factor of 48?

   (A) 6   (B) 12   (C) 16   (D) 18   (E) 24

2. A 3×3 magic square consists of nine different numbers placed in a grid in such a way that the sum of the numbers in each row, each column, and the two main diagonals is the same. The numbers 5, 10, 15, 20, 25, 30, 35, 40, and 45 are used to form a magic square. Some of these numbers have been placed, as shown. Find the the value of X.

 | 20 | 45 | |
   |----|----|----|
   | | | X |
   | | | 30 |

   (A) 10   (B) 15   (C) 35   (D) 40   (E) 45

3. Maddie and her mother's ages are both perfect squares. In four years, her mother will be five times her age. What is the sum of their ages now?

   (A) 26   (B) 29   (C) 37   (D) 40   (E) 45

4. In the diagram below all scales are balanced. How many □'s does x represent?
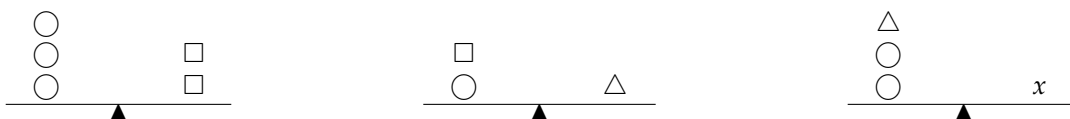
   (A) 1   (B) 2   (C) 3   (D) 4   (E) 5

5. Three hedgehogs (Ronny, Steph and Pat) are having a race against two tortoises (Ellery and Olly). At some point in the race Steph (S) is 10 m behind Olly (O), and Olly is 25 m ahead of Ronny (R). Ronny is 5 m behind Ellery (E), and Ellery is 25 m behind Pat (P). The order, from first to last, of the five racers at this point in the race spells the word:

   (A) PORES   (B) POSER   (C) PROSE   (D) ROPES   (E) SPORE

6. One sunny afternoon, there are a lot of people walking their dogs in a dog park. In total there are 40 heads and 106 legs. What is the number of people minus the number of dogs?

   (A) 2   (B) 6   (C) 8   (D) 13   (E) 14

7. The shaded area is what fraction of the total area of the triangle?

    (A) $\frac{1}{5}$ (B) $\frac{2}{9}$ (C) $\frac{1}{4}$

    (D) $\frac{1}{3}$ (E) $\frac{3}{8}$
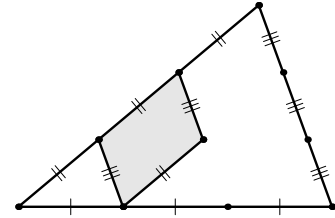
8. There is $150 in a store's cash register at the beginning of a day, and $348 at the end. If a 10% sales tax is charged on each purchase, how much of the money collected was sales tax?

    (A) $18   (B) $19   (C) $20   (D) $21   (E) $22

9. A baseball league has 9 teams. During the season, each team plays every other team 4 times. How many games are played in total?

    (A) 36   (B) 72   (C) 81   (D) 144   (E) 288

10. The value of the expression

    $$\frac{\left(\dfrac{1}{2} - \dfrac{2}{3}\right)}{\left(\dfrac{3}{4} - \dfrac{4}{5}\right)} \div \frac{5}{6}$$

    is:

    (A) $\frac{1}{144}$ (B) $\frac{1}{100}$ (C) $\frac{5}{6}$ (D) $\frac{25}{9}$ (E) 4

11. At a particular high school, 90% of the students take math, 94% take French, and x% take both math and French. Find the minimum value of x.

    (A) 0%   (B) 74%   (C) 84%   (D) 90%   (E) 96%

12. A wire is cut into two pieces of equal length. One is bent to form an equilateral triangle with area 2, and the other is bent to form a regular hexagon. What is the area of the hexagon?

    (A) 2   (B) $\frac{3}{2}\sqrt{3}$ (C) 3   (D) $2\sqrt{3}$ (E) 4