BRITISH COLUMBIA SECONDARY SCHOOL MATHEMATICS CONTEST, 2016

Junior Final, Part A

Friday, May 6

1. Theo got some birthday money from his grandparents. He spent half the money on a video game and a third of what was left on Pokémon cards. He now has $40 left. How much money did he get?

   (A) $80 (B) $120 (C) $160 (D) $200 (E) $240

2. Consider the product $54m$, where m is a positive integer. The smallest possible value of m for which the product is a perfect square is:

   (A) 4 (B) 6 (C) 9 (D) 12 (E) 24

3. How many 3-digit odd numbers use each of the digits 0, 3, and 5 exactly once?

   (A) 2 (B) 6 (C) 4 (D) 5 (E) None of these

4. Ten people decide to buy a car together, sharing the cost equally. If there had been five more in the group, the cost to each person would have been $100 less. What is the cost of the car?

   (A) $1500 (B) $3000 (C) $5000 (D) $6000 (E) $15000

5. Travelling only on paths that follow the arrows, how many paths are there from A to B?
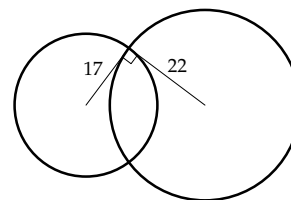
   (A) 10 (B) 13 (C) 17

   (D) 24 (E) 72
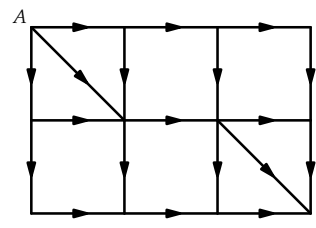
6. The number of positive integers n for which $\dfrac{n}{30 - n}$ is a positive integer is:

   (A) 4 (B) 5 (C) 6 (D) 7 (E) 8

7. A circle of radius 17 intersects another circle, radius 22, at right angles as shown. What is the difference of the areas of the non-overlapping portions?

   (A) 115π (B) 135π (C) 155π

   (D) 175π (E) 195π

8. In the addition shown below, A, B, C, and D are distinct digits. The number of different possible values for D is:

$$
\begin{array}{ccccc}
 & A & E & C & A \\
+ & B & C & D & B \\
\hline
F & E & E & D & D
\end{array}
$$

(A) 2   (B) 4   (C) 6   (D) 8   (E) 9

9. A room has a floor that is 6 m wide and 9 m long. The ceiling of the room is 3 m high. The room requires soundproof padding on the inner sides of the walls and ceiling, but not on the floor. The padding is 0.5 m thick. The total volume of padding required, measured in cubic metres, is:

(A) 62   (B) 64   (C) 68.5   (D) 70   (E) 72

10. The square $ABCD$ has side length 12. A circle of radius r drawn through B and C is tangent to $\overline{AD}$. Find r.

(A) 6   (B) $\frac{15}{2}$ (C) $3\sqrt{2}$

(D) 8   (E) $6\sqrt{2}$