BRITISH COLUMBIA SECONDARY SCHOOL MATHEMATICS CONTEST, 2026

Senior Final, Part A

May 1, 2026

1. If f is a function such that $f(0) = 1$, $f(1) = 3$ and

$$f(n+2) = 2f(n) - f(n+1),$$

then $f(5)$ equals

(A) -7 (B) -3 (C) 7 (D) 10 (E) 23

2. Suzanne and her father share a birthday. This year, they notice that if they reverse the digits of Suzanne's age, they get her father's age (and vice versa). Assuming they are both under 90 years of age, what is the minimum number of years that must pass before this can happen again?

(A) 10 (B) 11 (C) 15 (D) 22 (E) 30

3. For how many integers n is the number $30n^4 + 5n^2 + 10$ a perfect square?

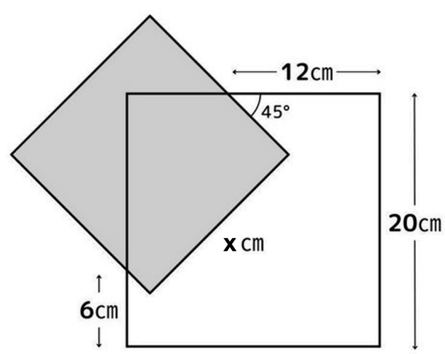
(A) 0 (B) 1 (C) 2 (D) 4 (E) more than 4

4. How many solution pairs (x, y) does the following system of equations have? Note: x and y can be any real numbers.

$$\begin{cases} y^2 = 25 - x^2 \\ y + x = x^2 - 6 \end{cases}$$

(A) 0 (B) 1 (C) 2 (D) 3 (E) 4

5. Consider two squares, one larger square of side length 20 cm, and one smaller square (shaded) of side length x cm. From the information given, find the area of the smaller square.



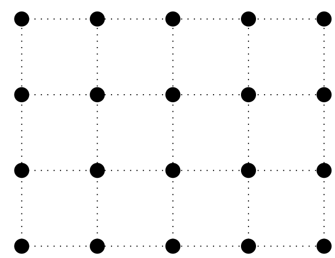
(A) 256cm^2 (B) 300cm^2 (C) 224cm^2 (D) 242cm^2 (E) 275cm^2

6. Calculate the following:

$$\frac{1}{\sqrt{1}+\sqrt{2}}+\frac{1}{\sqrt{2}+\sqrt{3}}+\cdots+\frac{1}{\sqrt{2025}+\sqrt{2026}}$$

(A) $\sqrt{2025}+1$ (B) $\sqrt{2026}-1$ (C) 2026 (D) $\sqrt{2026}$ (E) $\sqrt{2026}+2025$

7. A rectangular grid of 20 dots contains the corners of twelve 1×1 squares, six 2×2 squares, and two 3×3 squares, for a total of 20 squares with sides parallel to the sides of the grid. Find the smallest number of dots that can be removed so that each of the 20 squares is missing at least one corner.



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

8. A pile of \$1 coins is to be divided among three children. The first child is entitled to $\frac{1}{2}$ of the coins, the second to $\frac{1}{3}$ of the coins, the third to $\frac{1}{6}$ of the coins. Each child takes some number of coins from the pile so that no coins remain. The first child then returns $\frac{1}{2}$ of their coins, the second returns $\frac{1}{3}$ of their coins and the third returns $\frac{1}{6}$ of their coins. The returned coins are combined and divided equally among the three children. After this process, each child has exactly the number of coins to which they are entitled. What is the smallest possible number of coins in the pile?

(A) 102 (B) 186 (C) 282 (D) 324 (E) 360

9. A fly is sitting on the ceiling of a rectangular room. The distances from the fly to the three closest corners on the floor are 3m, 4m and 5m. Find the distance from the fly to the fourth corner on the floor.

(A) 8 (B) $2\sqrt{10}$ (C) 6 (D) $5\sqrt{3}$ (E) $4\sqrt{2}$

10. Two hikers start at the same time. The first hiker walks from point A to point B, the second from B to A. Each hiker walks at a constant speed. When the first hiker is halfway to B, the second hiker has 24 km remaining. When the second hiker is halfway to A, the first hiker has 15 km remaining. Find the distance between A and B.

(A) 36 (B) 40 (C) 32 (D) 48 (E) 12