APSMO

2026: DIVISION J
FOLLOW UP QUESTIONS

OLYMPIAD 1

Answers for Follow Up Questions
For teacher use only. Not for distribution.

1A:

Follow Up 1: What is Aaron's favourite number? [18]

Follow Up 2: What is my secret number? [145]

Follow Up 3: Teacher or peer review.

1B:

Follow Up 1: How many extra metres must she increase her run by each day (Day 11 - Day 15) to reach her goal? [200 m]

Follow Up 2: Altogether, how many stars are contained in the first 20 rows? [400]

1C:

Follow Up 1: How many distinct squares of any integer size are there? [41]

Follow Up 2: In this diagram, how many squares of any size do not include the shaded square? [39]

Follow Up 3: How many rectangles of all sizes are in this diagram? [11]

1D:

Follow Up 1: Find the length of the shortest possible wire if the combined areas of the two squares is 265 cm^2. [76 cm]

Follow Up 2: What is the greatest possible total area of the two squares in square centimetres? [577 cm^2]

Follow Up 3: What is the area of rectangle ABCD, in square centimetres? [184 cm^2]

1E:

Follow Up 1: If the spiral pattern continues, which number is immediately above 100? [65]

Follow Up 2: How many of the 1 × 1 tiles are black? [55]

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1A.

Follow Up 1:

When Aaron adds 43 to his favourite number and multiplies the sum by 5, his answer is 305.

What is Aaron's favourite number?

Follow Up 2:

If you double my secret number and then add 10, you get the same answer as when you subtract 200 from 500.

What is my secret number?

Follow Up 3:

Design some multi-step mystery number problems for a friend to solve. Challenge them with clues about place value, comparison or patterns.

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1B.

Follow Up 1:

In the first 10 days of training, Sarah has run a total of 14,500 metres, as shown in the table. She increased her run by 100 metres a day.

Sarah wants to have logged 27,000 total metres of training runs before the big race. She has 5 days of training left.

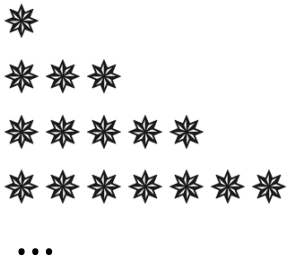
How many extra metres must she increase her run by each day (Day 11 - Day 15) to reach her goal?

Day 1	1,000 m
Day 2	1,100 m
Day 3	1,200 m
Day 4	1,300 m
Day 5	1,400 m
Day 6	1,500 m
Day 7	1,600 m
Day 8	1,700 m
Day 9	1,800 m
Day 10	1,900 m
Day 11	
Day 12	
Day 13	
Day 14	
Day 15	

Follow Up 2:

Each row of stars has two more stars than the row immediately above it, as shown.

Altogether, how many stars are contained in the first 20 rows?



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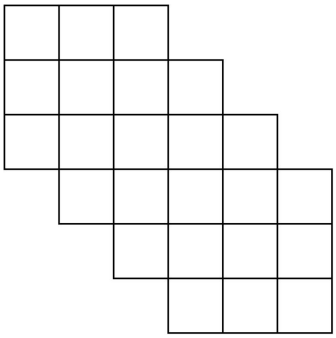
OLYMPIAD

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1C.

Follow Up 1:

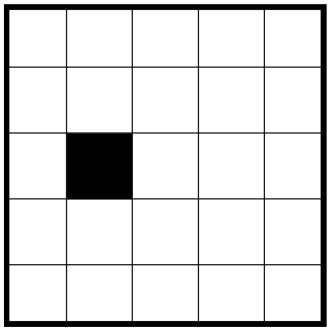
Given there are 13 distinct 2×2 squares in this figure, how many distinct squares of any integer size are there?



Follow Up 2:

As shown, the 5 × 5 “checkerboard” contains one shaded square.

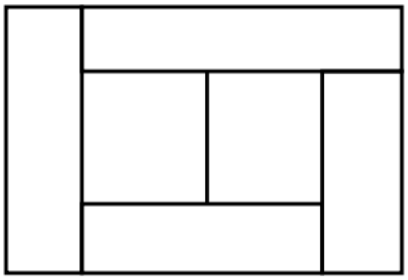
In this diagram, how many squares of any size **do not** include the shaded square?



Follow Up 3:

A large rectangle is cut into 6 smaller rectangles.

How many rectangles **of all sizes** are in this diagram?



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1D.

Follow Up 1:

A wire is cut into two pieces. The pieces are bent to form two squares whose side lengths in centimetres are whole numbers.

Find the length of the **shortest possible wire** if the combined areas of the two squares is **265 cm².**

Follow Up 2:

Suppose the total wire length was **100 cm.**

What is the greatest possible total area of the two squares in square centimetres?

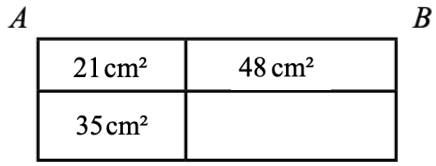
Follow Up 3:

Rectangle ABCD is split into four smaller rectangles as shown.

Each side of each rectangle is a whole number of centimetres.

The areas of three of the small rectangles are shown.

What is the area of rectangle ABCD, in square centimetres?



Not drawn to scale.

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1E.

Follow Up 1:

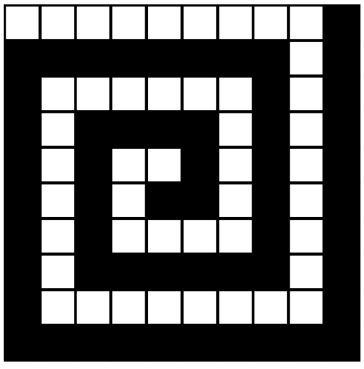
If the spiral pattern continues, which number is immediately above 100?

21	22	23	24	25	...
20	7	8	9	10	...
19	6	1	2	11	...
18	5	4	3	12	...
17	16	15	14	13	...

Follow Up 2:

A 10 × 10 square floor is to be entirely tiled with 1 × 1 black tiles and 1 × 1 white tiles in the spiral pattern shown.

How many of the 1 × 1 tiles are black?



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