

UK Maths Trust

TEAM MATHS
CHALLENGE
2024

REGIONAL FINAL

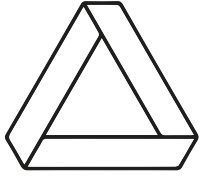
RELAY

A1

The size of the angles of a quadrilateral are x° , $2x^\circ$, $3x^\circ$ and $4x^\circ$.

What is the size, in degrees, of the largest angle?

ANSWER:



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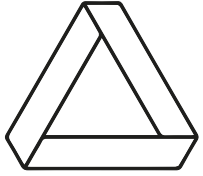
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A2

Two numbers have a difference of 20 and a sum of 24. What is their product?

ANSWER:



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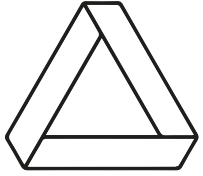
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A3

What is one tenth of one fifth of one half of £240?

ANSWER: £



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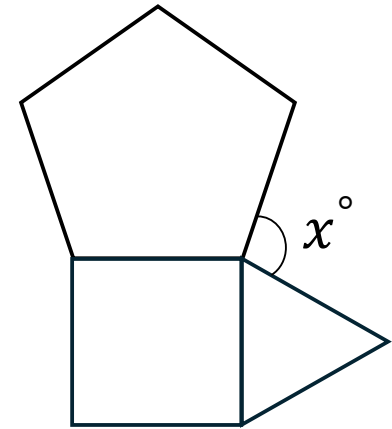
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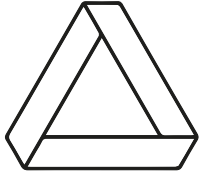
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A4

A regular pentagon, a square and an equilateral triangle are joined together as shown in the diagram. Find the size of angle x in degrees.



ANSWER:



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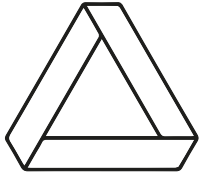
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A5

The number 2024 is the product of five prime numbers. What is their mean?

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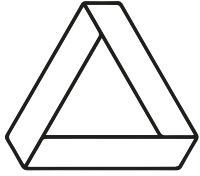
A6

Each of the symbols represents a different number, and all but one of the totals of the rows and columns are shown.

What is the missing total?

●	●	●	□	11
□	×	□	✓	?
✓	×	✓	✓	11
□	□	□	●	9
8	21	8	7	

ANSWER:



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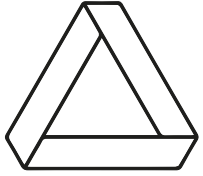
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A7

29 February 2024 was a Thursday. What day will 29 February 2028 be?

ANSWER:



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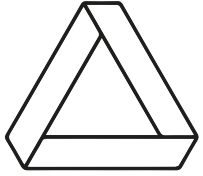
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A8

A security code is made up of two capital letters followed by three digits. How many possible security codes are there?

ANSWER:



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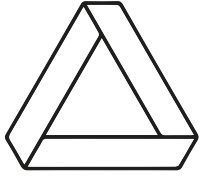
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A9

What is the sum of the first nine cubes?

ANSWER:



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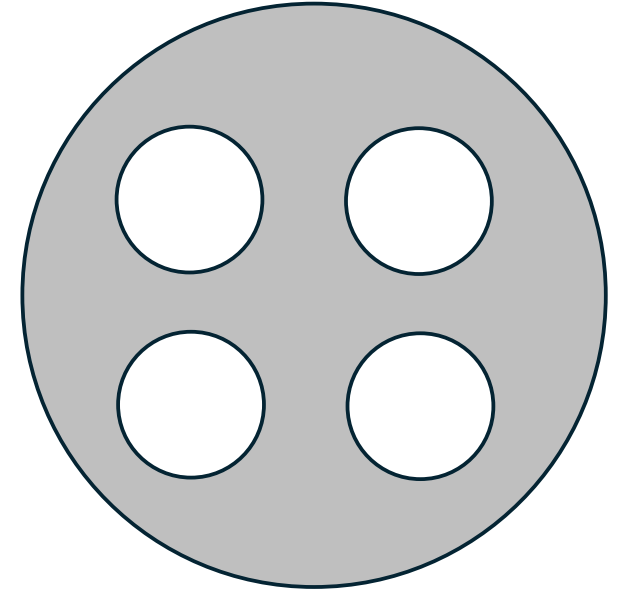
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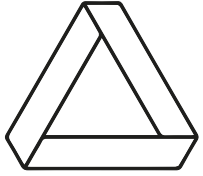
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A10

A circular button of radius 1 cm has 4 circular holes each of radius $\frac{1}{4}$ cm. What fraction of the area of the circle is not part of a hole?



ANSWER:



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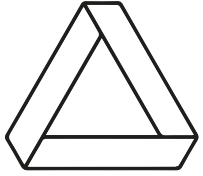
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A11

Five integers have a mean, median, mode and range of 5. What is the largest possible number any of them could be?

ANSWER:



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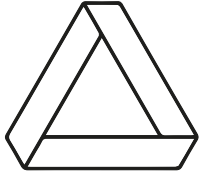
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A12

Three vertices of a parallelogram are: $(10, 1)$, $(8, 4)$ and $(18, 4)$.
What is the mean of the x -coordinates of the three possible coordinates for the fourth vertex?

ANSWER:



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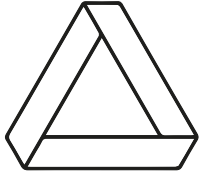
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A13

What size, in degrees, is the obtuse angle between the hands of a clock at 8:24?

ANSWER:



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A14

x , y and z satisfy the following equations:

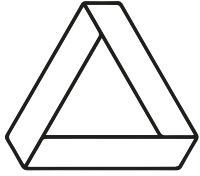
$$2x + y - z = 16$$

$$-x + 2y + z = 20$$

$$x - y + 2z = 12$$

What is the value of $x + y + z$?

ANSWER:



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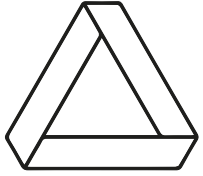
A15

A 60 m long train is travelling at 20 m/s. It passes a 4 m long bus, travelling in the same direction at 16 m/s, on a parallel road.

How long does it take from the instant the front of the train is beside the back of the bus, until the instant when the back of the train is beside the front of the bus?

ANSWER:

seconds



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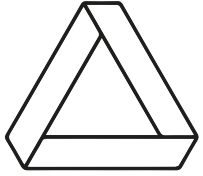
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B1

Alice thinks of a positive whole number, squares it, then adds 33. Her answer is between 200 and 210. What was her original number?

ANSWER:



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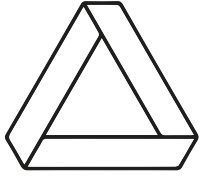
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B2

Three of vertices of a parallelogram have co-ordinates $(2, 5)$, $(1, 2)$ and $(12, 3)$. What are the co-ordinates of the other vertex, given that they are both positive?

ANSWER:



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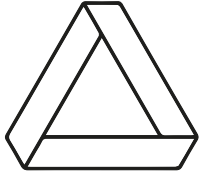
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B3

Which two consecutive even numbers multiply to give 2024?

ANSWER:



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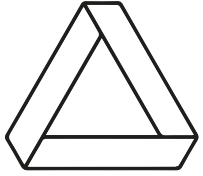
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B4

Two angles of an isosceles triangle are x° and $(x + 24)^\circ$. What is the difference between the two possible values of x ?

ANSWER:



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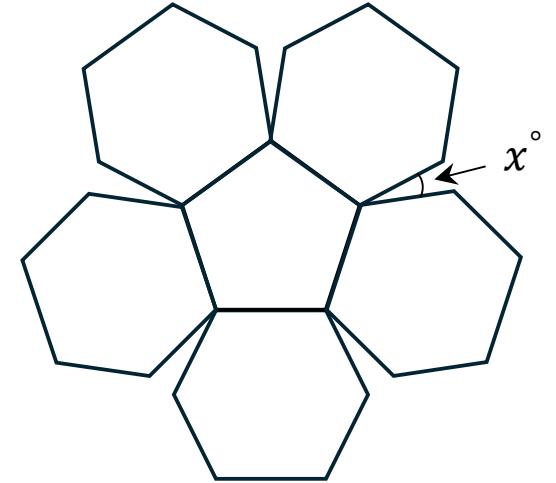
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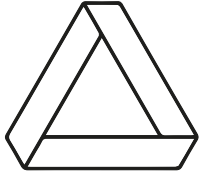
B5

A regular pentagon is surrounded by five regular hexagons.

What size is the angle between the sides of two adjacent hexagons?



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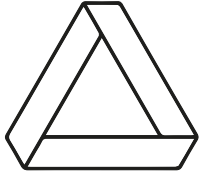
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B6

Five positive integers have a mean, median and mode of 24.
What is their greatest possible range?

ANSWER:



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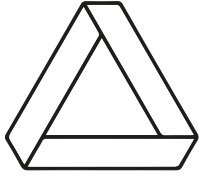
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B7

What percentage of the whole numbers between 31 and 55 inclusive are not multiples of 2, 3 or 5?

ANSWER:

%



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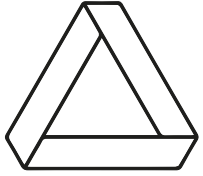
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B8

The five Olympic rings are coloured: blue, yellow, black, green and red. How many different ways can I choose two different coloured rings?

ANSWER:



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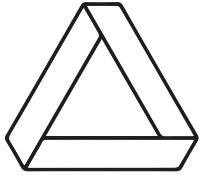
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B9

What is 80% of $\frac{5}{8} \times 1.6 \times \text{£}20.60$?

ANSWER: £



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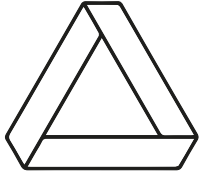
B10

Each of the symbols represents a different number, and all but one of the totals of the rows and columns are shown.

What is the missing total?

✓	✓	×	✓	10
✓	□	×	□	?
●	□	□	□	10
□	●	●	●	6
8	9	12	9	

ANSWER:



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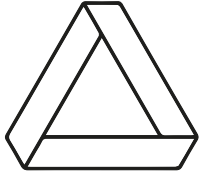
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B11

What is the obtuse angle between the hands of a clock at 12:20?

ANSWER:



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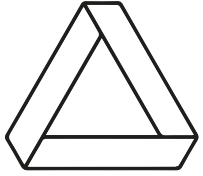
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B12

Frederick walked up a hill at a speed of 3 km/h and then walked back down the same way at a speed of 5 km/h. What was his average speed for the whole journey?

ANSWER:

km/h



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B13

x , y and z satisfy the following equations:

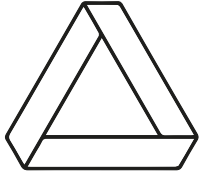
$$x + y = 24$$

$$y + z = 10$$

$$x + z = 6$$

What is the value of $x + y + z$?

ANSWER:



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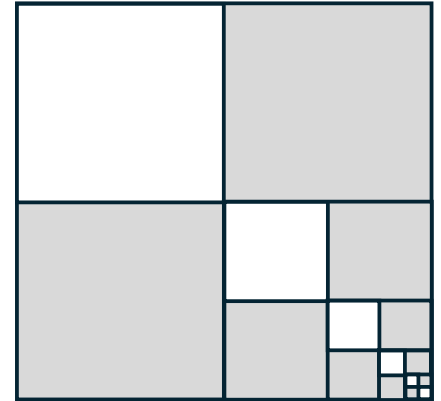
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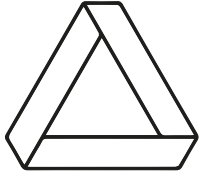
B14

A square is split into four squares. Two of these are shaded and one is split into four more squares and the pattern continued. The diagram shows the square after the first few splits.

What fraction of the total square will be shaded if the pattern is continued indefinitely?



ANSWER:



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B15

The lengths of the edges of a cuboid, in cm, are all integers.

The volume of the cuboid is 210 cm^3 .

The cuboid fits inside a cube of volume 729 cm^3 .

What is the total surface area of the cuboid?

ANSWER:

cm^2