

A1

TEAM MATHS
CHALLENGE
2015

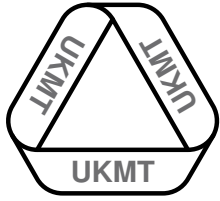
REGIONAL
FINAL

RELAY

Harry eats 35% of a cake, Martha eats 15% of it and Joshua, who does not understand percentages yet, eats one fifth of it.

What fraction is left for their grandmothers to eat?

ANSWER:



A2

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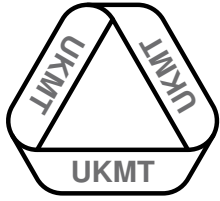
RELAY

A milk tanker travels 40 miles from the farm to the cheese factory at a constant speed of 60 mph, starting with a full tank of 400 gallons of milk. The milk has been leaking at a constant rate throughout the journey at 75 gallons per hour.

How much milk remains in the tank when it arrives?

ANSWER:

gallons



A3

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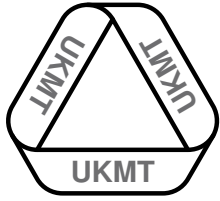
RELAY

A litre of water weighs 1 kg, and a litre of ice weighs 870 g.

What is the difference in kg between the weights of 6 litres of water and 5 litres of ice?

ANSWER:

kg



A4

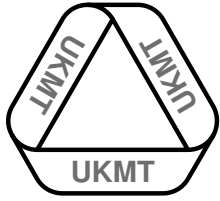
What is the smallest positive integer x for which $x^2 + 3x + 5$ is a prime number?

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RELAY

ANSWER:



A5

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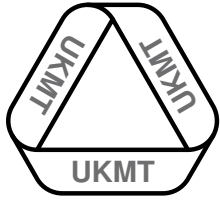
RELAY

The integers from one to eleven are written in numerical order.
They are then rewritten in alphabetical order.

Two integers each appear in the same position in the alphabetical list as they do in the numerical list.

What is their sum?

ANSWER:

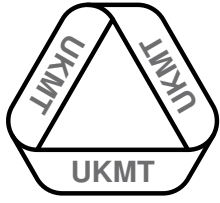


I was interested in studying the word length of a passage in the book I am reading. Below is a frequency table of my findings.

Number of letters	1	2	3	4	5	6	7	8	9
Frequency	0	1	2	3	2	0	1	0	1

What is the number you get by multiplying the mean by the range?

ANSWER:



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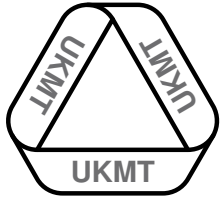
RELAY

A rectangle has an area of 66 cm^2 . When the height of the rectangle is increased by 2 cm and the length decreased by 3 cm a square is formed.

What is the area of the square?

ANSWER:

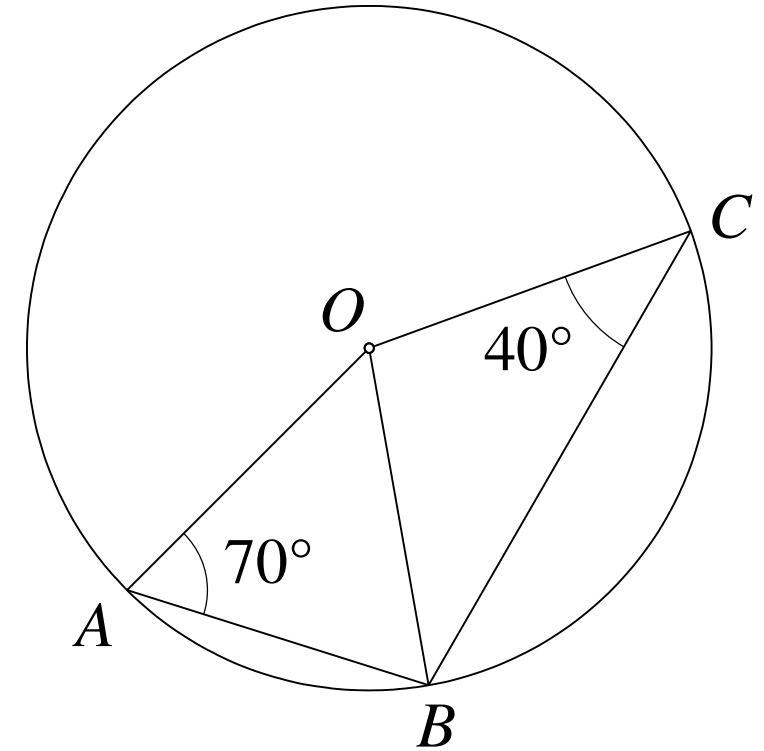
cm^2



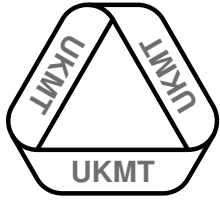
In the diagram, O is the centre of the circle, and A , B and C are points on the circumference.

Angle $OAB = 70^\circ$ and
angle $OCB = 40^\circ$.

What is the angle ABC ?



ANSWER:



A9

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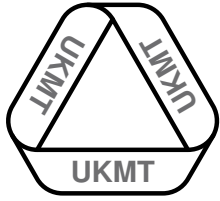
REGIONAL
FINAL

RELAY

A shop sells zigs, zogs and zags. Five zigs cost the same as six zags, and seven zogs cost the same as four zigs.

Write them in order of cost, cheapest first.

ANSWER:



A10

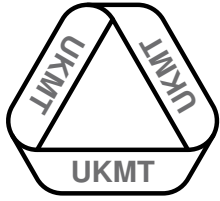
What is the median of all the factors of 2015?

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ANSWER:



A11

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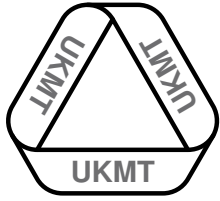
RELAY

A metal bar weighs 68 kg, and it is made into 20 000 identical pendants.

What is the weight of each pendant in grams?

ANSWER:

68



A12

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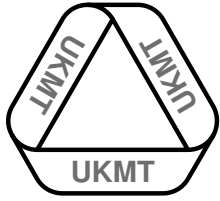
REGIONAL
FINAL

RELAY

115	116	117	118
135	136	137	138
155	156	157	158
175	176	177	178

What is the sum of all the prime numbers in the table above?

ANSWER:



A13

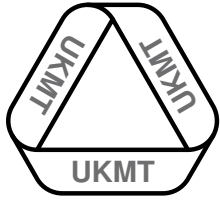
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RELAY

What is the difference in the acute angles between the hands of a clock showing two o'clock and between the hands of a clock showing quarter past two?

ANSWER:



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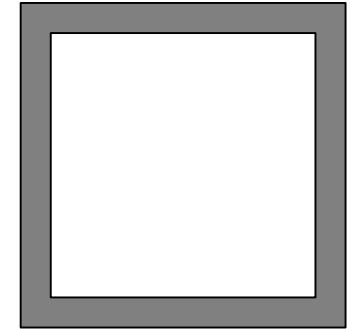
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A14

I have a square garden of side 6.4 m to make into a vegetable patch. I decided to put sleepers onto the square to form a frame around the garden. Each sleeper is 60 cm wide.

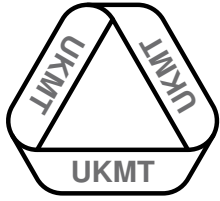
What will be the surface area of the soil inside the sleeper frame?



← 6.4 m →

ANSWER:

m²



A15

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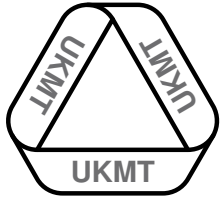
REGIONAL
FINAL

RELAY

Three of the vertices of a rectangle are $(-3, -3)$, $(5, 1)$ and $(-1, -5)$.

What are the coordinates of the centre of the rectangle?

ANSWER:



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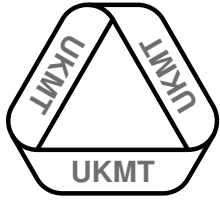
REGIONAL
FINAL

RELAY

40% of the members of a school mathematics club were boys, and there were 72 girls.

How many members did the club have?

ANSWER:



B2

a and b are positive integers such that $a^2 + b^2 = 13^2$.

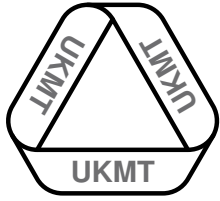
What is the value of ab ?

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RELAY

ANSWER:



B3

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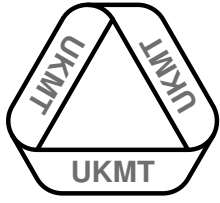
REGIONAL
FINAL

RELAY

I ran a race at a constant speed and my time was recorded as 4.80 minutes.

Change this time to seconds.

ANSWER:



B4

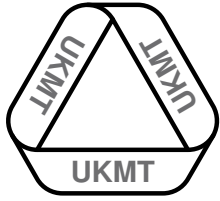
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FINAL

RELAY

What is the difference in the acute angles between the hands of a clock showing one o'clock and between the hands of a clock showing twenty past one?

ANSWER:



B5

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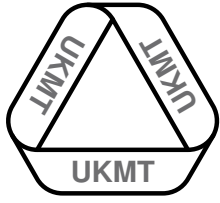
RELAY

A block of plastic weighing 60 kg is made into 15 000 identical key fobs.

What is the weight of each fob in grams?

ANSWER:

60



B6

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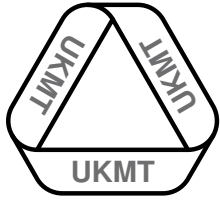
REGIONAL
FINAL

RELAY

A shop sells migs, mogs and mags. Five migs cost the same as six mags, and seven mogs cost the same as four migs.

Write them in order with the cheapest first.

ANSWER:



B7

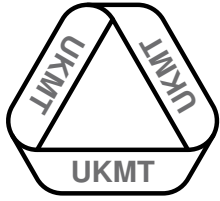
What is the smallest positive integer x for which $x^2 + 2x + 7$ is a prime number?

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RELAY

ANSWER:



B8

What is the sum of the median, mode, mean and range of the following set of numbers?

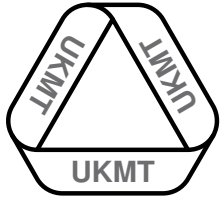
3, 3, 4, 5, 10.

ANSWER:

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RELAY



B9

A quadrilateral can have 1, 2 or 4 interior right angles.

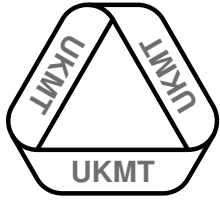
What is the greatest possible number of interior right angles in a hexagon with all angles less than 180° ?

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RELAY

ANSWER:



B10

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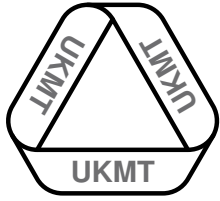
RELAY

The area of a rectangle is 238 cm^2 . When the height of the rectangle is increased by 1 cm and the length decreased by 2 cm a square is formed.

What is the area of the square?

ANSWER:

cm^2



B11

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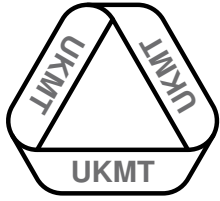
RELAY

The rectangle $ABCD$ is reflected in the line $y = x$.

$A = (10, 2)$, $B = (8, 2)$, $C = (8, 7)$, $D = (10, 7)$.

What are the coordinates of the centre of the new rectangle after reflection?

ANSWER:



B12

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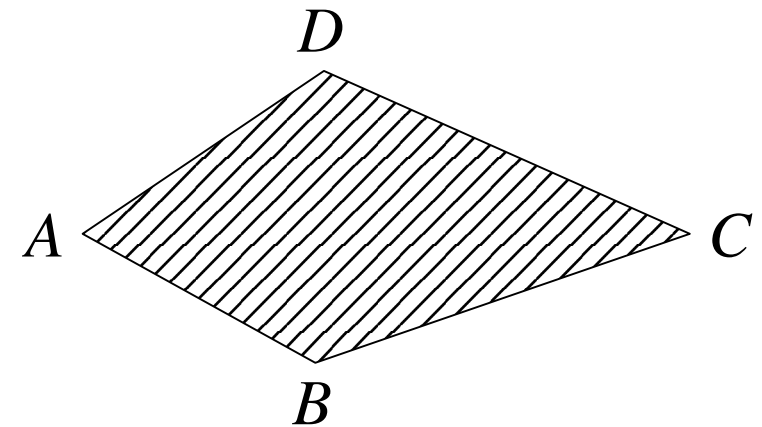
REGIONAL
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RELAY

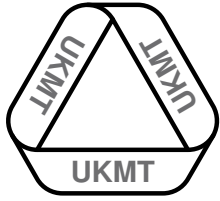
I tried to draw a kite without measuring instruments. I measure the angles on my shape and notice that it is not quite symmetrical.

Angle $BAC = 35^\circ$, angle $ABC = 120^\circ$, angle $ADC = 130^\circ$ and angle $CAD = 30^\circ$.

What is the reflex angle at C ?



ANSWER:



B13

Art ate $\frac{1}{3}$ of a packet of sweets, Bert ate 25% and Caz ate $\frac{1}{5}$.

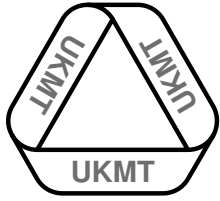
What fraction was left for Diz?

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RELAY

ANSWER:



B14

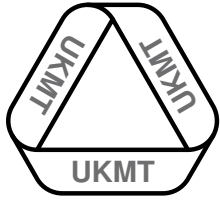
What is the mean of all the factors of 2015?

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RELAY

ANSWER:



B15

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REGIONAL
FINAL

RELAY

Speedy Sam drives at an average speed of 66 mph on a trip, and cautious Chris drives back at an average speed of 44 mph.

What is their average speed for the whole trip?

ANSWER:

mph