

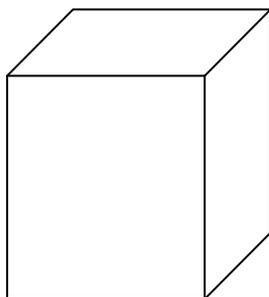


UKMT Team Maths Challenge 2013  
Regional Final - Relay

# A1

The volume of a cube is  $343 \text{ cm}^3$ .

What is the surface area of the cube?



Answer

$\text{cm}^2$



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## A2

Bob likes his coffee cooled and has observed that it is just right to drink seven minutes after it is made. It takes six minutes to make the coffee. Bob wants to drink his coffee at 11:03.

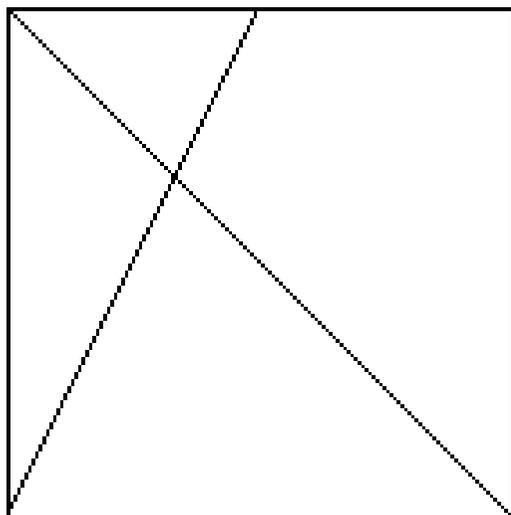
At what time should he start to make the coffee?

Answer
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# A3



How many triangles  
are in this diagram?

Answer



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# A4

Calculate:

$$\frac{1}{2}(8^3) - 6^2$$

Answer
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**A5**

What is the median of all the prime factors of 2013?

Answer



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# A6

What is the sum of the squares of the first three prime numbers?

Answer
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# A7

Thirty people go on a weekend coach trip. The ratio of men to women on the coach is 1:4. On the second day four more women join the trip.

What is the new ratio of men to women? Give your answer in its lowest terms.

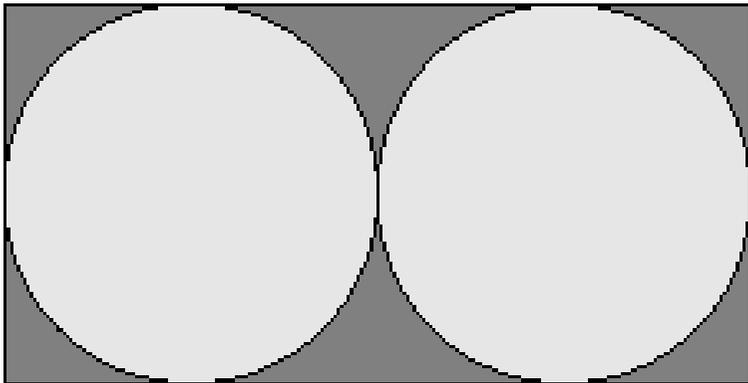
Answer
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# A8

The diagram shows two identical circles, each of radius 4.25 cm, and a rectangle that just touches both circles. What is the area of the rectangle?



Answer	cm <sup>2</sup>
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# A9

At Christmas a mathematical grandmother finds that the sum of the ages of her two eldest grandsons is 24. Next Christmas the product of their ages will be 168. How old are they each now?

Answer	and
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# A10

In a class of 32 pupils, five-eighths were boys, who were all present. One quarter of the girls were absent. How many pupils were present?

Answer
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# A11

Celeste starts off facing north-west. She turns  $120^\circ$  anticlockwise, then  $165^\circ$  clockwise.

In which direction is she facing now?

Answer
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# A12

In this magic square each of the rows, columns and the two main diagonals has the same total. What number replaces  $n$ ?

Give your answer in its simplest terms

$\frac{3}{4}$	$\frac{7}{8}$	
	$\frac{5}{8}$	
$n$		$\frac{1}{2}$

Answer



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# A13

Sums United played football in a local league. The teams were given three points for a win, one for a draw and none for losing. At the end of the season, Sums United had 45 points after playing 24 games. They drew six games. How many did they lose?

Answer
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# A14

Below is a record of the minimum and maximum temperatures for a week in June. What is the mean daily temperature range?

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
min	3	5	5	4	4	7	9
max	20	18	20	17	18	22	20

Answer

○



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# A15

Each row and column has one each of the four letters U, K, M and T. Complete the bottom line of the grid.

U		M	T
	T		
		K	M
K			



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# B1

Nine students were selected at random and their shoe sizes recorded:

5 6 4 6 7 4 8 3 4

What is the median shoe size?

Answer
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## B2

A train is carrying 42 people. When six men get on the ratio of men to women is 1:5. How many women are on board the train?

Answer
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## B3

When I add the squares of two positive consecutive whole numbers the answer is 145.

What is the total of the two positive consecutive numbers?

Answer
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## B4

When the caretaker sets up the hall for school examination week it takes an average of 15 seconds to put up a table and 10 seconds to put a chair at each table in the right place.

How many minutes will it take to set up the hall for 72 candidates?

Answer
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## B5

A nurse needs to give the correct amount of medicine to a patient who is going away for a fourteen-day holiday. One dose is 10 ml and the patient needs the medicine three times a day.

How much medicine will be required altogether?

Answer

ml



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# B6

What is the mean of all the prime factors of 2013?

Answer



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# B7

Write down the answers to the following calculations,  
in ascending order.

$$\frac{1}{3} \text{ of } 21$$

$$1^2 + 2^3$$

$$\frac{1}{3} \left( \frac{1}{4} \times 48 \right)$$

Answer
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# B8

Triangle  $ABC$  has vertices with coordinates  $A (2,1)$ ,  $B (5,1)$  and  $C (5,4)$ .

The triangle is rotated  $90^\circ$  clockwise about the origin.  
What are the coordinates of the image of  $C$ ?

Answer ( , )
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# B9

This year, 2013, is written using four consecutive digits.

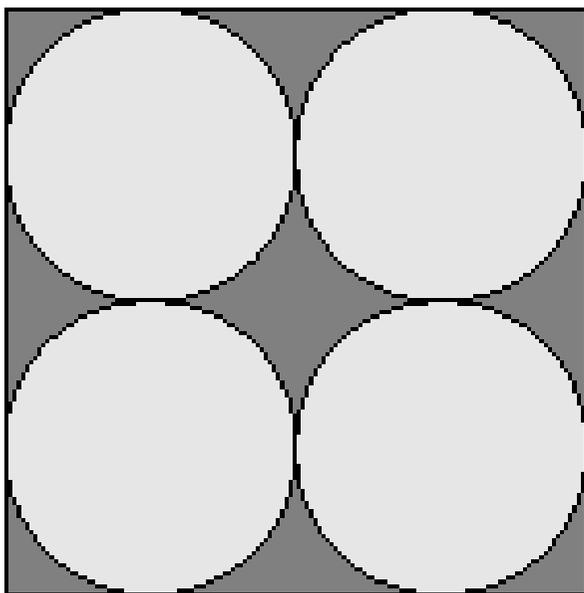
When was the last year that used four consecutive digits?

Answer



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# B10



The diagram shows four circles, each with radius 3.5 cm.

What is the area of the square that just surrounds them?

Answer	cm <sup>2</sup>
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# B11

A children's book must have at least 20 sheets and cost no more than £2.20. A sheet with only black ink will cost 3p, and a sheet with colour will cost 25p.

What is the maximum number of coloured sheets that will be possible?

Answer
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# B12

A square of side 8 cm has an equilateral triangle drawn onto each of its sides to create a new shape.  
What is the perimeter of the new shape?

Answer	cm
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# B13

Harry starts off facing south-east. He turns  $135^\circ$  clockwise, then  $90^\circ$  anticlockwise.

In which direction is he facing now?

Answer
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# B14

Sue's heart beats 72 times in a minute when she is sitting doing calculations.

She starts a page of problems at precisely 12:47, and finishes at precisely 13:12.

How often has her heart beaten in this time?

Answer
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# B15

Two different digits in this calculation are replaced by # and @.

$$36 \times 6\# = 23@4$$

What is the sum of the missing digits?

Answer
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