A1

What is the sum of the prime factors of 2010?

Answer

A2

A box weighs 242 kg when full and 188 kg when half full. How much does it weigh, in kilograms, when empty?
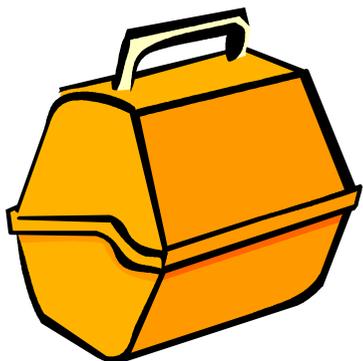
Answer _____ kg

A3
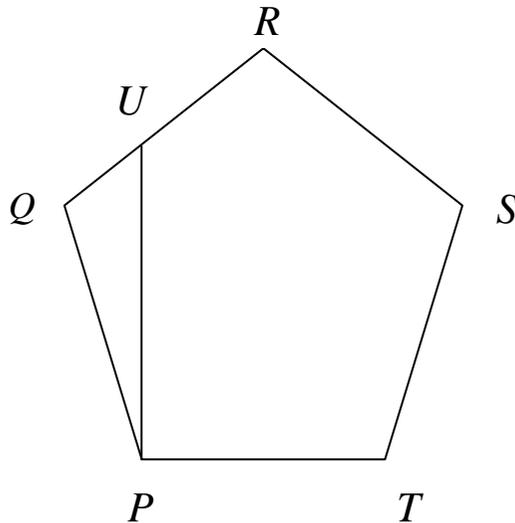
PQRST is a regular pentagon. *PU* is perpendicular to *PT*. What is the size of angle *QUP*?

Answer _____ degrees

A4

Three tenths of a number is one more than two sevenths of the number. What is the number?
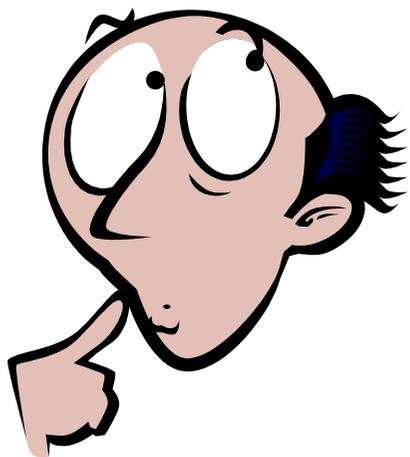
Answer

A5

How many millilitres of water must be added to 360 ml of orange cordial containing 50% juice to make a drink containing 30% juice?

Answer _____ ml

A6

St Trinian's school day starts at 8:40 am and ends at 3:30 pm. How many degrees does the hour hand of a clock turn through in a school day?

Answer ⬚ degrees

A7

The four members of the winning team at a Regional TMC final each received a pencil case. Two were red, one green, and one blue. Two of the team were twins, and wanted different coloured cases. In how many different ways could the cases have been awarded?

Answer

A8

Three tiles meet at a point without leaving a gap or overlapping.

They are a square, a regular hexagon, and another regular polygon.

How many sides does the other polygon have?

Answer

A9

Find the value of

$$\sqrt{(3^4 \times 2^3 \times 5) + (2^3 \times 3^2 \times 5)}.$$
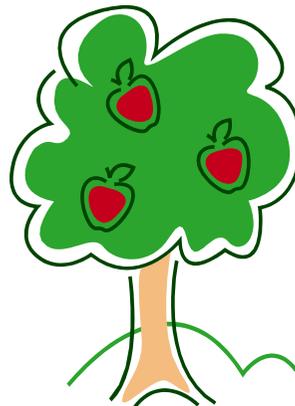
Answer

A10

A pie chart is being prepared, showing the numbers of various tree types in a park. The table shows the angles for the four main types. The "Other" section represents 12 trees.

Tree type	Pie chart angle
Oak	90°
Ash	135°
Lime	60°
Sycamore	45°
Other	

How many trees are there altogether in the park?

Answer _____ trees

A11

What are the letters, in order, of the diagonal from top left corner to bottom right corner of this grid if each row, column and 2×2 block shown contains the letters UKMT?

	M		U
U		T	

Answer

A12

The teacher with a TMC team has a bag of sweets. She eats one, and gives half the remainder to the pupil with most right answers, then repeats the eating one and giving half to each of the other three team members in order. The final 3 sweets left in the bag she offers to the scorers. How many sweets were in the bag initially?

Answer _____ sweets

A13

In 1610 Galileo discovered the four largest moons of Jupiter: Io, Ganymede, Europa and Callisto. The mass of the Earth is 6.0×10^{24} kg. The mass of Europa is 1.48×10^{23} kg.

To one decimal place, what percentage is this of the Earth's mass?

Answer

A14

A mathematical granny has 5 grandchildren whose ages are 1, 6, 7, 10 and 12. She bakes an apple tart in a circular dish, and decides to divide it between them in the ratio of their ages. How many degrees bigger is the biggest slice than the smallest?

Answer _____ degrees

A15

The letters *A* to *F* represent different digits from 0 to 5 in these two multiplications.
What is the 6 digit number *A B C D E F*?

$$
\begin{array}{r}
A\ F\ F\ D \\
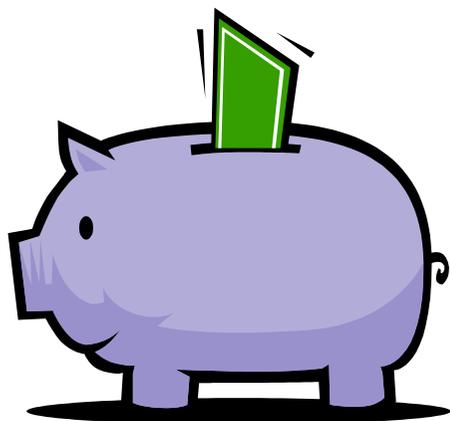E\ \times \\
\hline
E\ F\ A\ F
\end{array}
\qquad\qquad
\begin{array}{r}
A\ B\ C \\
A\ D\ \times \\
\hline
E\ F\ A\ F
\end{array}
$$

Answer

B1

Harry counts the money in his piggy bank at the end of each month. On March 31st he had £4.00. On April 30th the total had decreased by 10%. During May his savings increased by 15%. How much was in his piggy bank on 31st May?

Answer £

B2

The National Final of the Senior Team Maths Challenge was on the third of February this year. Many of the teachers writing the dates on forms were interested to see that they wrote four consecutive descending numbers, with a bit of punctuation.

How many months from that date will be the next date with four consecutive decreasing numbers?

Answer   months

B3

Nicky gives her cats, Sid and Lou, a dish of munchy biscuits. One third of the biscuits are green, and the rest are brown. Sid eats 2 green biscuits for each 3 that Lou eats, and 4 brown biscuits for each 3 that Lou eats.

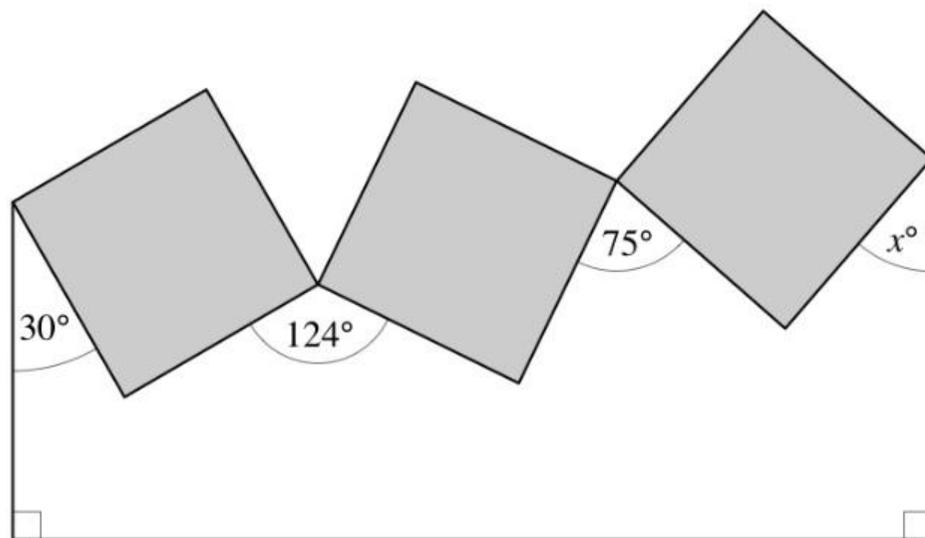What fraction of the biscuits does Sid eat?

Answer

B4

Three squares are attached at their corners and strung between two vertical poles as shown. Find the value of x.

Answer

B5

What are the letters, in order, of the diagonal from top left corner to bottom right corner of this grid if each row, column and 2×2 block shown contains the letters UKMT?

		K	
			U
U			
M	T		

Answer

B6

Boris and Michael are jogging in the same direction around a lake. It takes Boris 6 minutes to complete a lap and Michael 8 minutes. After completing each lap the boys take a rest, Boris for 1 minute and Michael for two minutes. They then continue jogging. If they start jogging together, how long, in minutes, does it take until they are next together?
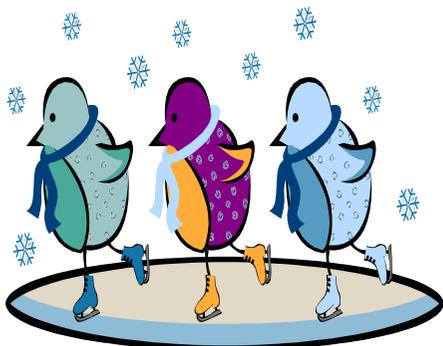
Answer _____ minutes

B7

During a cold winter, half the 600 litres of water in my rectangular pond froze. The volume of water increases by 10% when it turns to ice. My pond is 1.5 metres wide and 2 metres long. How many centimetres higher was the level after freezing than before?

(1 litre of water occupies 1000 cm^3.)

Answer _____ cm

B8

Hamilton High School starts at 8:30 am and finishes at 3:30 pm each day. What is the number of times the hour and minute hand form a right angle on the school clock during a school day?
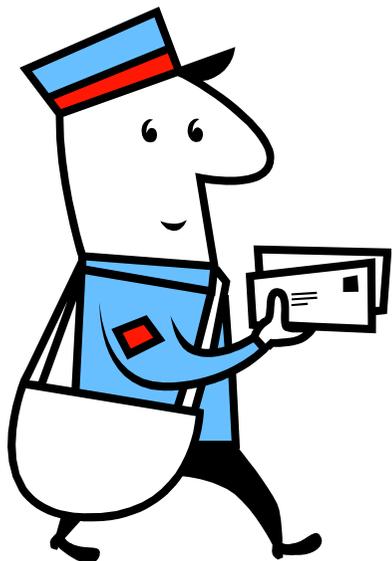
Answer

B9

A distracted postman has 4 letters to deliver to 4 different houses. He puts one at random through each letterbox. What is the probability that they are all delivered correctly?

Answer

B10

If $2T + M = C$ and $C + M = 3T$

what is the value of $T \div M$?

Answer

B11

A set of axes is drawn on one-centimetre squared paper. The points A, B and C have coordinates (2,0), (4,3) and (0,5).

What is the area of the triangle ABC?

Answer _____ cm^2

B12

In 1610 Galileo discovered the four largest moons of Jupiter: Io, Ganymede, Europa and Callisto. The mass of the Earth is 6.0×10^{24} kg. The mass of Callisto is 1.08×10^{23} kg.

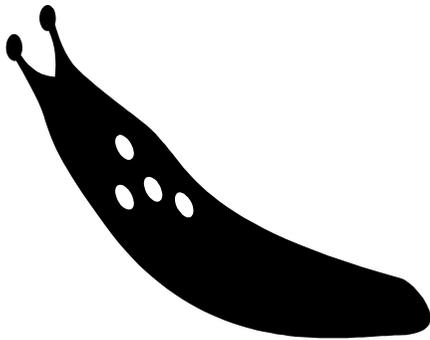To one decimal place, what percentage is this of the Earth's mass?

Answer

B13

A slug in my garden moves in a straight line from one corner of the 2m by 1m rectangular plot where it has eaten a lettuce to the diagonally opposite corner to eat a strawberry.

To the nearest 10 cm, how far did it travel?

Answer _____ cm

B14

A bag contains coloured counters. Each counter has a positive whole number on it. One third of the counters are yellow and the rest are blue. The probability that a yellow counter has an even number on it is three eighths and the probability that a blue counter has an even number on it is one quarter.

Calculate the probability that a counter, drawn at random, has an even number on it. Give your answer as a simplified fraction.

Answer

B15

What is the value of

$$\sqrt{90\frac{1}{4}} - \sqrt{\sqrt{39\frac{1}{16}}} \; ?$$

Answer