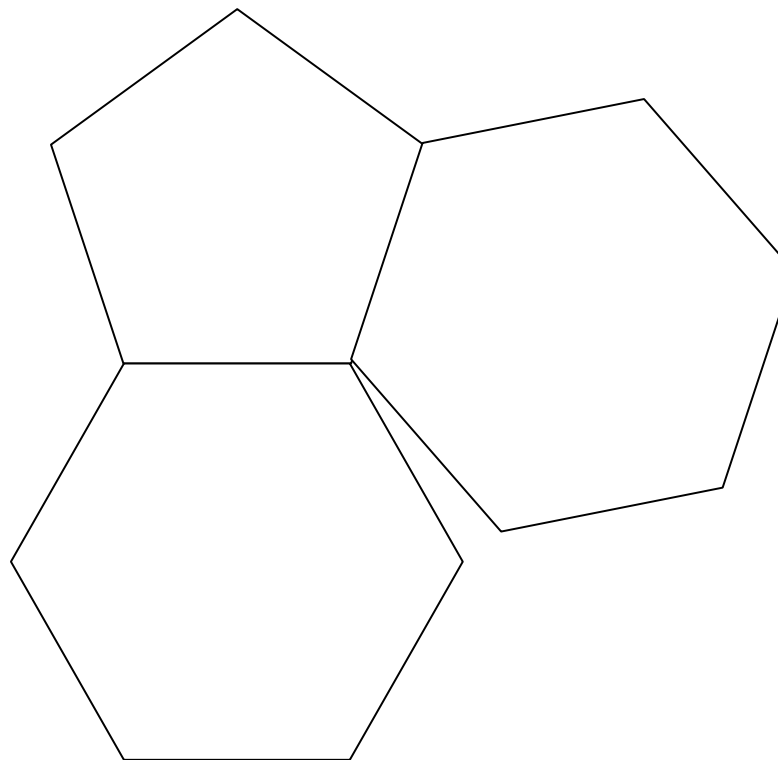




A1

Two regular hexagons are drawn on the sides of a regular pentagon. What is the size of the angle between the hexagons?



Answer <input type="text"/>



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A2

The digit total of 2011 is a square number. What are the next two years with square digit totals?



Answer

and



A3

What is the value of
 $\clubsuit + \star + \diamond + \blacksquare + \heartsuit$ if
the rows and columns
have the totals given?

\clubsuit	\clubsuit	\clubsuit	12
\star	\blacksquare	\heartsuit	14
\diamond	\blacksquare	\clubsuit	11
12	14	11	



Answer



A4

A mathematical grandmother organises a quiz with four rounds for her four youngest grandchildren, U, K, M and T. They finish in that order in the first round, and in alphabetical order in the second round. She has arranged that they will each win a 1st, 2nd, 3rd and 4th place. In what orders do they finish in the next two rounds?

Answer

and



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A5

S equals 20% of U, and $U = 50\%$ of M.

If $S + U + M = 80$, what is S worth?



Answer



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A6

What is the smallest whole number by which 2940 must be multiplied to make a square number?

Answer



A7

Everpool and Liverton drew 3-3 in their latest football match.

How many possible different half-time scores are there?

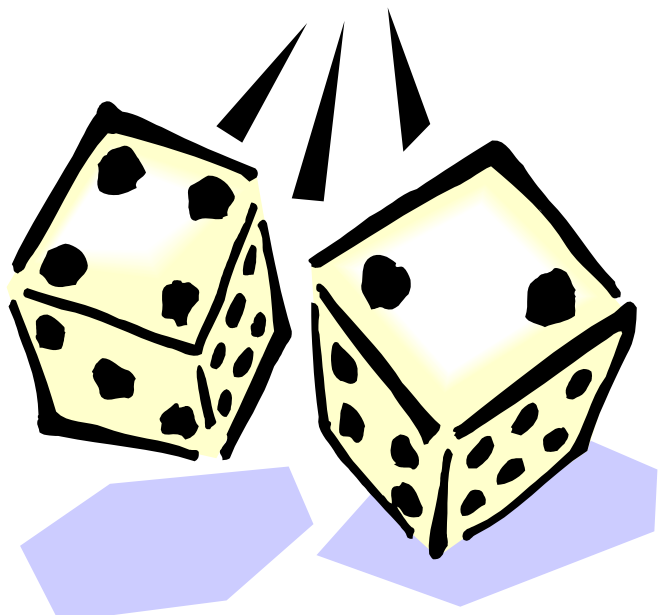


Answer



A8

Two ordinary fair dice are rolled. The score is calculated by multiplying the difference of the numbers by their sum. What is the probability of scoring 0?



Answer



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A9

What is the angle between the hands of a clock at half past eight?



Answer

0



A10

A pupil takes 16 minutes to do 24 very similar problems. At this rate how long would he take to do 30 problems?



Answer

mins



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A11

What are the ages of Ann, Beth and Chris if:

$$\text{Ann} + \text{Beth} = 15,$$

$$\text{Beth} + \text{Chris} = 12,$$

$$\text{Chris} + \text{Ann} = 17?$$

Answer: Ann Beth Chris



A12

A school bag has only books and lunch in it, and weighs 700g. When the books are removed it weighs 360 g. The lunch weighs half as much as the books. How heavy is the empty bag?



Answer

80



A13

When walking in the park I saw a number of dogs and their owners walking past a flock of geese. In all there were 80 legs, 24 wings and 30 heads. (All had the usual number of legs, heads and wings.)

How many dogs were there?



Answer



A14

A modern artist draws a circle and a triangle which overlap. The overlapping area is two-thirds the area of the circle and a quarter the area of the triangle. What is the ratio of the area of the circle to the area of the triangle?



Answer	:
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A15

A non-regular octagon is drawn.

Some of the angles are 120° .

All the others are 160° .

How many of the angles are 120° ?

Answer



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B1

Find the sum of all the prime numbers less than 20.



Answer



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B2

The point $(3,4)$ is reflected in the line $x = 5$.

What are the coordinates of its image?

Answer (,)

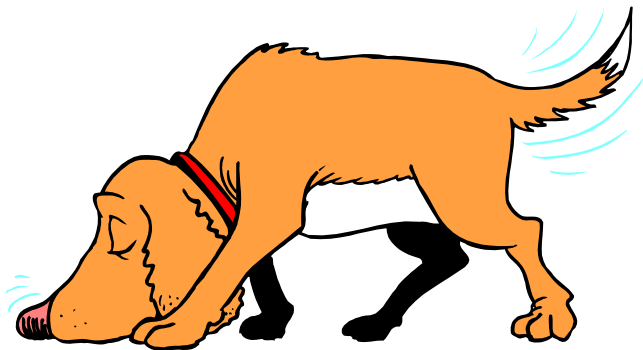


B3

When walking in the park I saw a number of dogs and their owners. There were 13 bodies and 44 legs.

(All had the usual number of legs.)

How many dogs were there?



Answer



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B4

The digit total of 2011 is a square number. What were the last two years with square digit totals?



Answer

and



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B5

Five numbers have a mean, median, mode and range of 7.

One of the numbers is 8. What are the five numbers (in ascending order)?

Answer , , , ,



B6

The sequence 20, 21, 7, . . . is formed using the rule “If the last number is a multiple of 3 then divide by 3. If not, add 1”.

Complete the sequence until you reach 1, writing all the numbers in the answer box.

Answer



B7

A chemical is sold in cartons measuring 25 cm wide, 15 cm long and 9 cm high. The research department decides to save money by packing it in boxes holding the same volume, but in the shape of a cube.

What is the height of this cube?



Answer

cm



B8

A teacher spends 4 hours doing her marking one evening. She spends half the time marking arithmetic, one fifth marking algebra and one eighth marking geometry. The only thing left to mark is probability. How many minutes does that take?



Answer

mins



B9

At 09:00 Art is driving along a road at 50 km/hr.

Bert is 1 km ahead of Art, travelling at 40 km/hr in the same direction.

If they keep the same speeds, when does Art overtake Bert?

Answer :



B10

Two ordinary fair dice are rolled. The score is calculated by multiplying the difference of the numbers by their sum. What is the highest possible score?



Answer



B11

A modern artist draws a square and a triangle which overlap. The overlapping area is half the area of the square and two thirds the area of the triangle. What is the ratio of the area of the square to the area of the triangle?



Answer	:
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B12

A machine makes a thousand widgets. George removes three eighths of the total and Harry takes 24% of it. How many widgets are left?

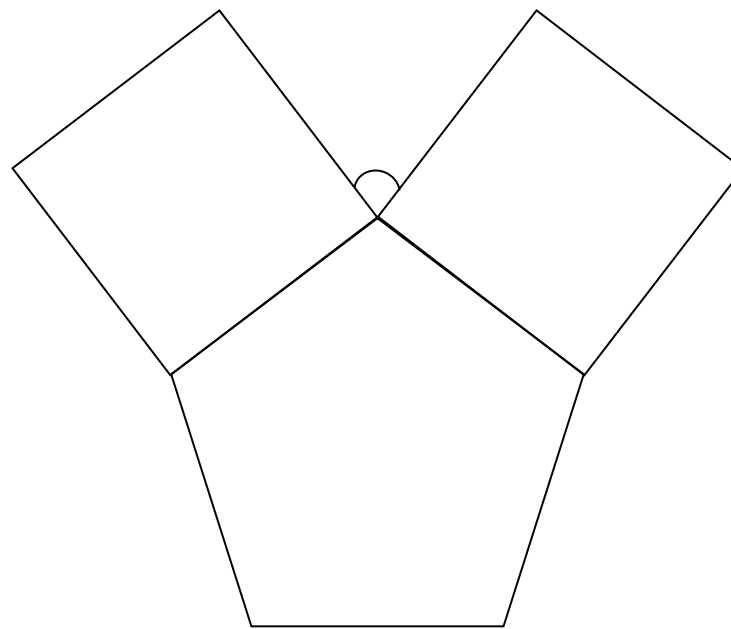
Answer



B13

Two squares are drawn on adjacent sides of a regular pentagon, as shown in the diagram.

What is the size of the marked angle?



Answer

0



B14

A farmer stands by a marker in the middle of a field. He walks for 100 metres on a bearing of 040° then for 200 metres on a bearing of 130° and finally for 100 metres on a bearing of 220° . How far is he from his marker?



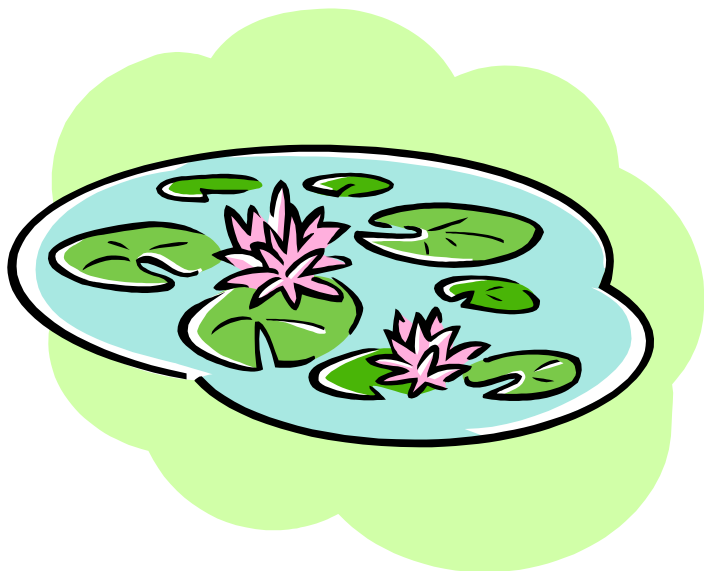
Answer	m
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B15

When 49 litres of water escape from my pond, the amount of water in the pond is reduced by 35%.

What is the volume of water left in the pond?



Answer

litres