

Year 10 Mathematics - Summer Work - AF into Higher

Find the lowest common multiple (LCM) of 90 and 52

In May 1999, the population of a country was 720,000.

In May 2019, the population was 770,000.

Work out the percentage increase.

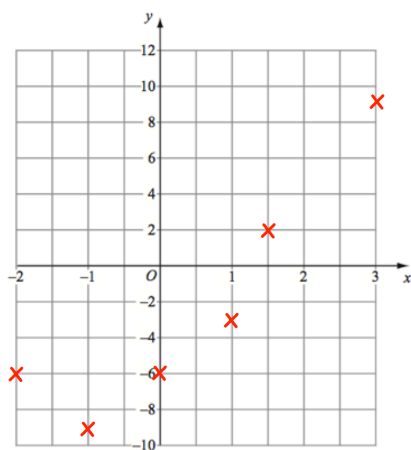
There are 280 counters in a box.
They are red, blue and yellow.
A quarter of the counters are red.
There are 4 times more blue than yellow counters in the bag.

The ratio of yellow counters to red counters is 1 : n

Find n

Jaxon is drawing the graph of
 $y = x^2 + 2x - 6$

| | | | | | | |
|---|----|----|----|----|---|---|
| x | -2 | -1 | 0 | 1 | 2 | 3 |
| y | -6 | -9 | -6 | -3 | 2 | 9 |



Write down two things that Jaxon has done wrong.

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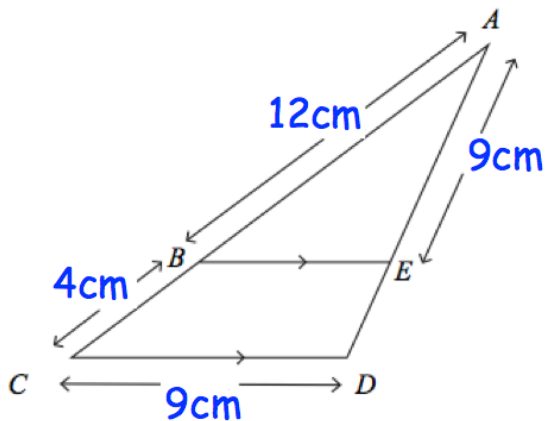
Factorise $x^2 - 14x + 48$

Work out the size of each interior angle of a regular decagon

A line has equation $y = \frac{1}{2}x - 3$

Write down the gradient of the line

Write down the coordinates of the y-intercept of the line



CD is parallel to BE.

Find the length of DE.

Find the length of BE.

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The front elevation of a solid shape is a triangle.
The side elevation of the solid shape is a triangle.
The plan view of the solid shape is a circle.

Write down the name of the shape.

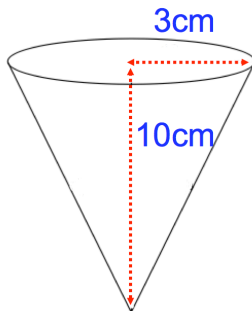
James has x pence.
Hannah has 5 pence more than James.
Liam has 2 pence less than James.

The total amount of money they have is 75 pence.

Use this information to write down an equation in x .

Solve the equation to find out how much money James has

How much money does Liam have?



Calculate the volume of the cone.

A man's salary has increased by 5% and is now £441 a week.

What was his salary before the increase?

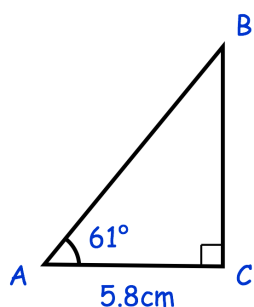
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Solve

$$x^2 + 5x + 4 = 0$$

| Goals | Number of matches |
|-------|-------------------|
| 0 | 3 |
| 1 | 5 |
| 2 | 9 |
| 3 | 1 |
| 4 | 2 |

Calculate the mean number of goals per match.



Calculate the length of the line BC

There are $3\frac{9}{10}$ cups of sugar in a bag.
Max bakes 10 cakes, with each one needing $1\frac{1}{3}$ cups of sugar.

How many bags of sugar did Max need?

The Highest Common Factor (HCF) of two numbers is 6.
The Lowest Common Multiple (LCM) of the same numbers is 60.

What are the two numbers?

Year 10 Mathematics - Summer Work - Foundation Plus

Round 8.19 to one decimal place

Round 6.43492 to one decimal place

To pass you will need
to answer $\frac{3}{4}$ of the
questions correctly.



| | |
|-------|----|
| Alan | 14 |
| Barry | 16 |
| Carl | 13 |
| Donna | 19 |
| Emma | 20 |
| Fiona | 10 |

Work out which students passed the test

Mrs Johnson set 6 students a test.
The test has 20 questions.



This is a biased coin.
The probability of a head is $\frac{3}{4}$
It is flipped 60 times.

How many heads do you expect?

$$x = 7$$

Work out the value of

$$\frac{(1 + x)^2}{2}$$

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Solve $\frac{w}{3} = 6$

Solve $4w + 6 = 38$

Apples cost £2.00 per kg
Oranges cost 28p each
Tomatoes cost £2.50 per kg

Dara buys:
0.5 kg of apples
2 oranges
2 kg of tomatoes

Work out the total cost

$p = 4$
 $a = 5$

Work out the value of $3a + 4p$

Darius and Sahil are playing a game.
Each boy has 3 attempts.

Their scores are:

Darius: 35, 45, 10

Sahil: 50, 19, 30

Which boy has the highest mean score?

66% $\frac{13}{20}$ 0.606 $\frac{1}{2}$ $\frac{3}{5}$

Arrange in order of size.
Start with the largest.

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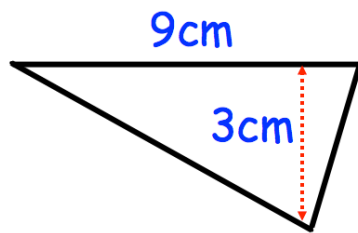
The numbers 1 to 12 inclusive are placed in a hat.
John takes a number out of the bag at random.

What is the probability it is a 5?

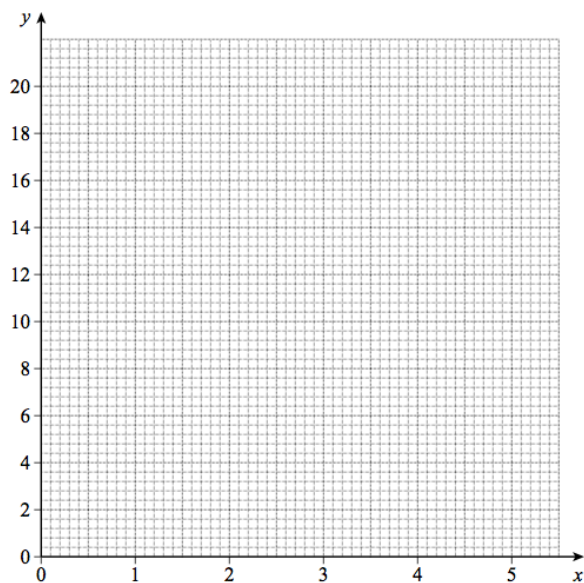
What is the probability it is an odd number?

Increase £8 by 30%

Increase £8 by 35%



Find the area of this triangle



Complete the table of values for $y = 3x + 3$.

| | | | | | | |
|---|---|---|---|---|---|---|
| x | 0 | 1 | 2 | 3 | 4 | 5 |
| y | | | | | | |

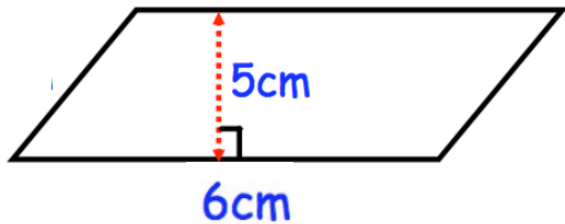
On the grid draw the graph of $y = 3x + 3$ values of x from 0 to 5

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A sequence has the rule, multiply the previous number by three and then add one

1 4 13 _ _

Fill in the missing numbers



Find the area of the parallelogram

A shop sells jars of honey in two different sizes.

Medium: 600g for £4.25

Large: 1kg for £6.99

Which jar is better value for money?

James is going on holiday in New York.
James changes £800 into dollars (\$).

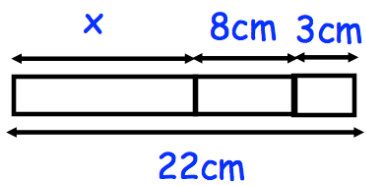
The exchange rate is £1 = \$1.50

Work out how many dollars (\$) James will receive.

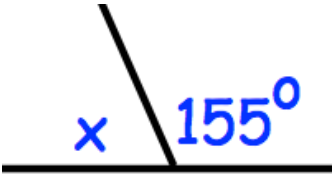
Write these numbers in order of size.
Start with the smallest number.

88 % 0.099 $\frac{4}{5}$ 0.9 $\frac{17}{20}$

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Find x



Find x




Work out

$$783 \div 9$$

Manchester City have played 30 games in a season.

Complete the tally chart.

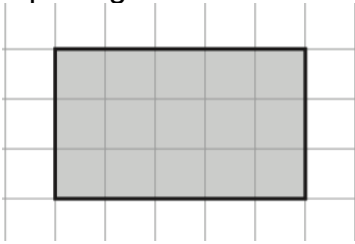
| Result | Tally | Frequency |
|--------|-------|-----------|
| Win | | |
| Draw | | |
| Loss | | |

  
Pattern 1 Pattern 2 Pattern 3

Draw Pattern 4

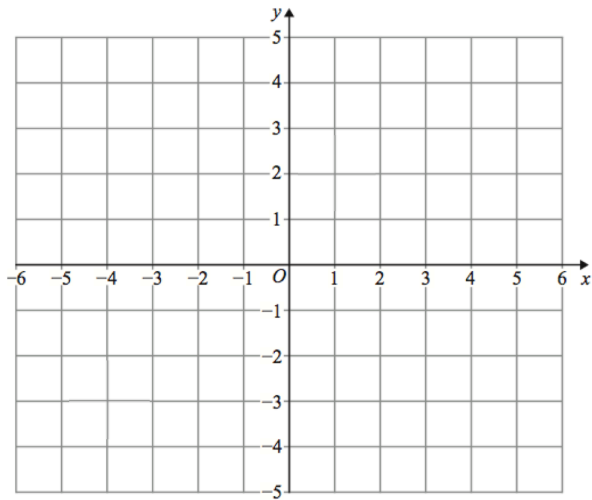
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Shown is a rectangle on a centimetre square grid.



Work out the area

Work out the perimeter



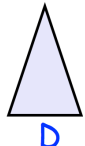
Plot the points with these coordinates

A(-2, 1)

B(4, 1)

C(4, -3)

Name the shape ABC



Which shape has 4 lines of symmetry

Which shapes have 1 line of symmetry

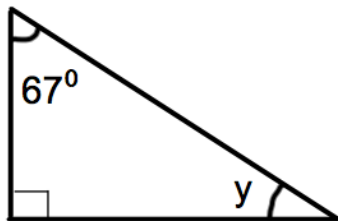
Which shape has 5 lines of symmetry

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Work out $420 - 168$

List the first 5 multiples of seven

List the factors of 20



Find y

Express 50p as a fraction of £8
Give your answer in its simplest form.

Which is larger?

20% of 80

or

80% of 20

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$$\begin{array}{r} 4 \quad \square \\ + \quad \square \quad 4 \\ \hline 7 \quad 2 \end{array}$$

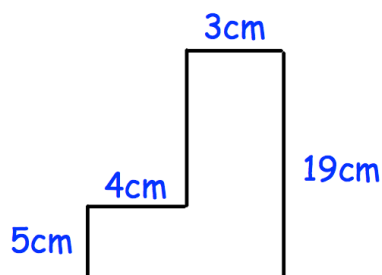
| City | Distance from London |
|-------------|----------------------|
| Los Angeles | 8766 km |
| Sydney | 17012 km |
| Tokyo | 9577 km |
| Cape Town | 9680 km |

Which of these cities is the furthest away from London?

Which number in the table is a multiple of 10?

Aisha needs 42000 blocks of Lego to build a large castle.
The lego blocks are sold in boxes of 2000.

How many boxes of lego does she need?



Find the area

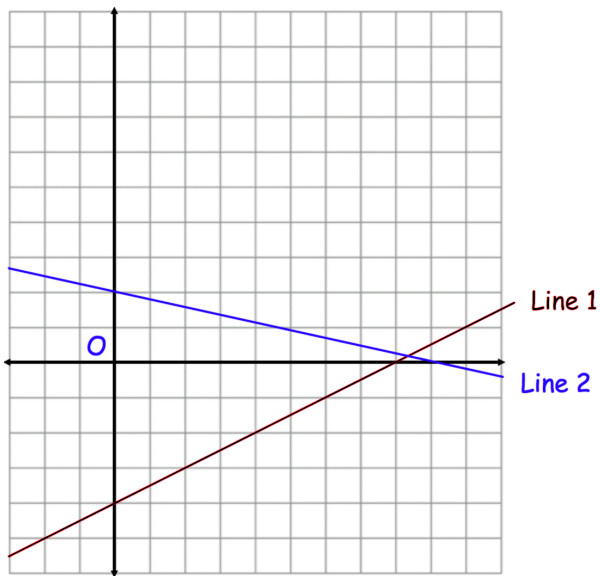
Year 10 Mathematics - Summer Work - Higher Plus - Grades 7-9

Simplify fully

$$\frac{4x^2 - 25}{6x^2 - 11x - 10}$$

Find the value of x

$$2^x \times 4^{x+3} = 16$$



Line 1 has equation $y = \frac{3}{2}x - 24$

Find the equation of Line 2

Are the lines perpendicular?

A triangle has sides of 8cm, 9cm and 13cm.

Calculate the difference between the smallest and largest angles.

Year 10 Mathematics - Summer Work - Higher Plus - Grades 7-9

Write 16 in the form 8^n

Rationalise the denominator

$$\frac{\sqrt{3}}{1 + \sqrt{6}}$$

The equation of a circle C, with centre O, is $x^2 + y^2 = 225$

Write down the coordinates of 5 points that lie on C.

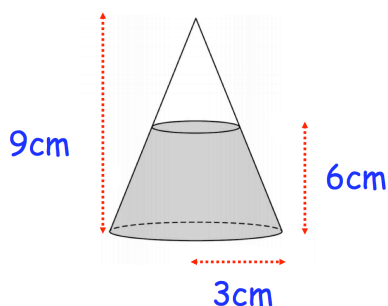
In a class, there are 12 girls.
Two of the girls are going to be chosen at random to give a presentation.

Work out the number of possible different pairs that can be chosen.

The area of an equilateral triangle is 200cm^2

Find the length of each side.
Give your answer to 2 decimal places.

Year 10 Mathematics - Summer Work - Higher Plus - Grades 7-9



Find the volume of liquid in the container

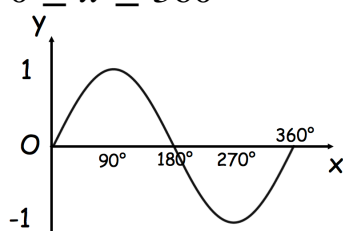
The table shows the waiting times of patients at a doctors surgery.

| Time, t (minutes) | Frequency |
|---------------------|-----------|
| $0 < t \leq 10$ | 24 |
| $10 < t \leq 20$ | 31 |
| $20 < t \leq 30$ | 50 |
| $30 < t \leq 40$ | 35 |
| $40 < t \leq 50$ | 60 |

Find an estimate of the median wait time.

Two patients are picked at random. Find the probability that both patients waited more than 30 minutes.

Here is the graph of $y = \sin(x)$ for $0 \leq x \leq 360$



One solution of $\sin x = -0.5$ is $x = 330^\circ$

Find another solution of $\sin x = -0.5$

Solve the equations

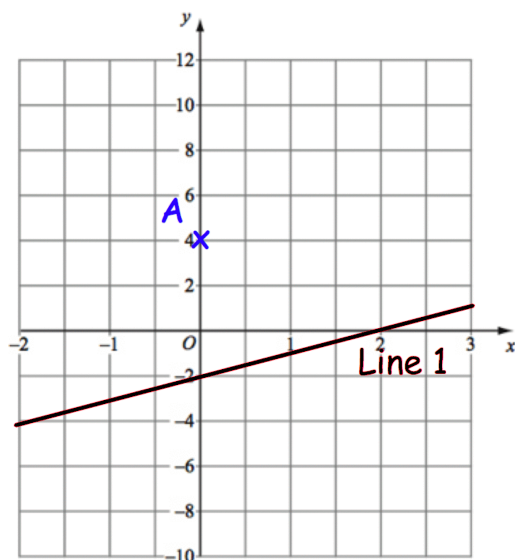
$$2x + y = 11$$

$$2x^2 - y^2 = 23$$

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Arrange the following in order, smallest first

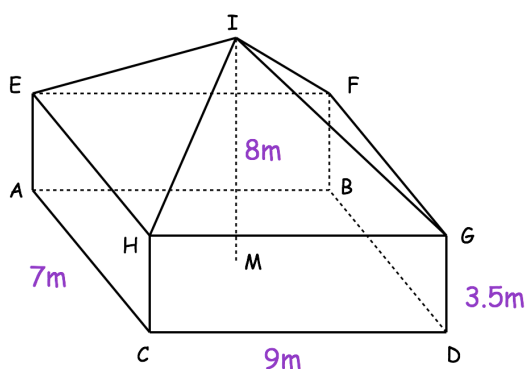
$$25^{-\frac{1}{2}} \quad \left(\frac{2}{3}\right)^{-2} \quad 0.\dot{1}$$



Write down the equation of the line perpendicular to Line 1 and passing through A.

Find the shortest distance between Line 1 and A.

The diagram shows a cuboid and a pyramid.
The apex I is directly above the centre M, of ABDC.



Calculate the angle between EHI and ACHE

Year 10 Mathematics - Summer Work - Higher - Grades 5-7

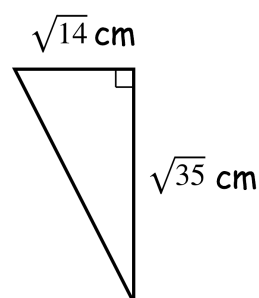
What is the sum of the interior angles of an octagon?

What is the size of each interior angle of a regular octagon?

Calculate the gradient of the straight line passing through (4, 2) and (7, 11).

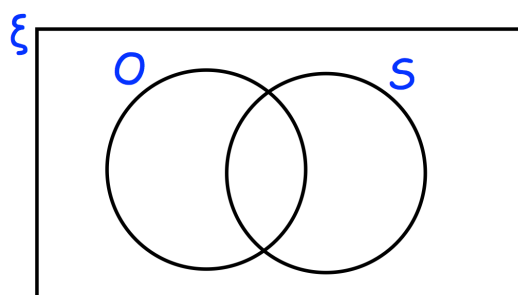
Write down the equation of the line.

Find the length of the missing side.



$\xi = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13\}$
 $O = \{\text{odd numbers}\}$
 $S = \{\text{square numbers}\}$

Draw a Venn diagram for this information.

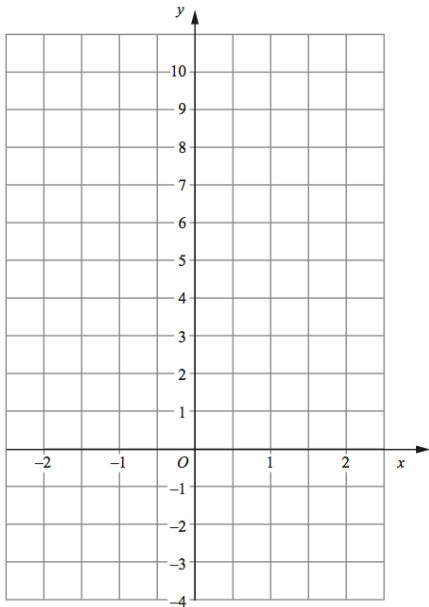
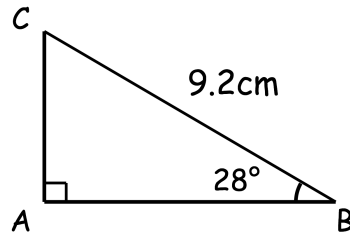


Write down $P(O \cap S)$

Write down $P(O \cup S')$

Year 10 Mathematics - Summer Work - Higher - Grades 5-7

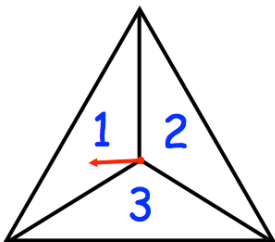
Find the perimeter of triangle ABC.
Give your answer to 3 significant figures.



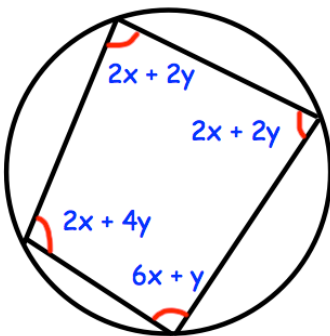
Complete the table of values for $y = 3^x$

| | | | | | |
|-----|----|----|---|---|---|
| x | -2 | -1 | 0 | 1 | 2 |
| y | | | | | |

Draw the graph of $y = 3^x$
for values of x from -2 to 2



A fair spinner is spun twice.
A score is found by adding the two numbers together.
Find the probability of a score of 6



Find x and y

Year 10 Mathematics - Summer Work - Higher - Grades 5-7

Solve, giving your answers to one decimal place.

$$8x^2 - 8x - 9 = 0$$

Lorcan invested £4000 in a savings for one year.
He receives interest at the end of the year.

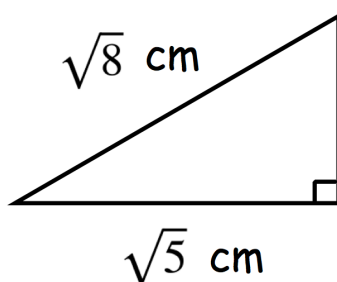
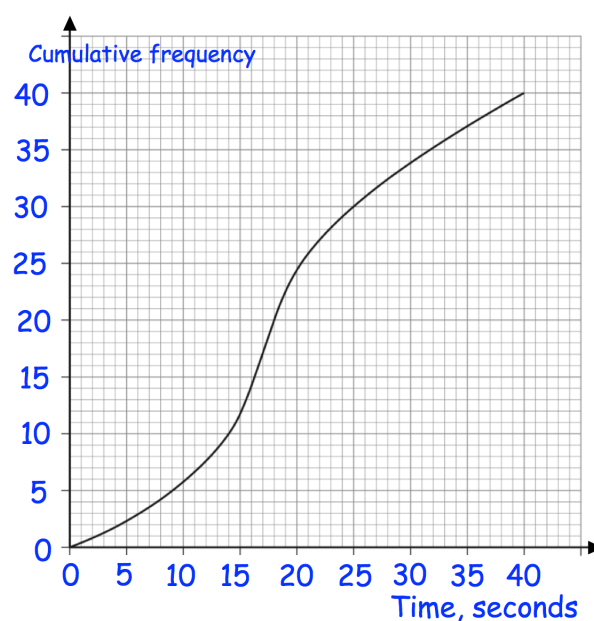
Lorcan gives 30% of the interest to his sister, Beth.
Lorcan gives Beth £7.20.

Work out the percentage interest rate for the savings account.

The graph shows information about the time taken by 40 children to answer a question.

Find an estimate for the interquartile range.

Show that less than 20% of the children took longer than 30 seconds.



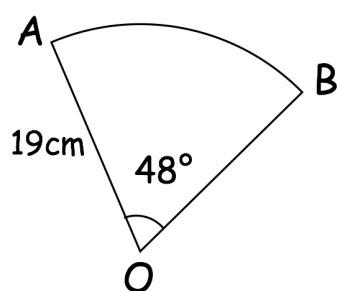
Calculate the length of the missing side.
Leave your answer as a surd.

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What is the probability of rolling a six, three times in a row on an ordinary dice?

Ella has a 4 digit padlock.
Each dial can be set to 0, 1, 2, 3, 4, 5

Work out the total number of different combinations that have four different digits.



Find the area of the sector OAB.

Plank A

Volume = 750cm^3
Mass = 900g

Plank B

Volume = 0.0152m^3
Mass = 7.6kg

Plank C

Volume = 1000cm^3
Mass = 1.02kg

Mr.Dixon is building a toy boat for his son. He has three different planks of wood to choose from.
If wood has a density under 1g/cm^3 , it will float.

Which plank of wood is the most suitable?

Explain your answer.