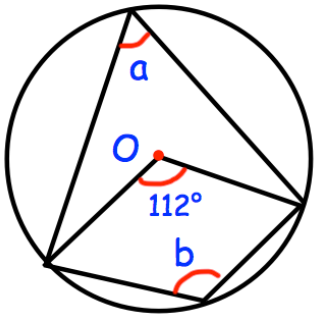
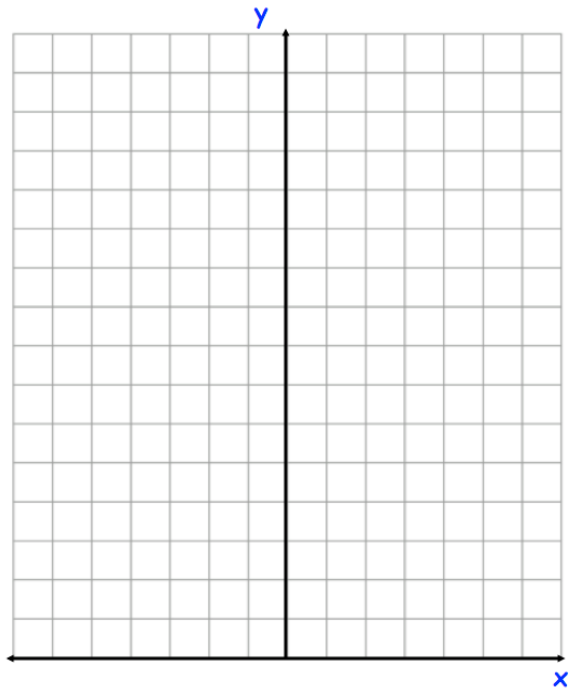
Name: _____ 5-a-day Higher

1st May

Corbettmaths



Find a and b



Draw the graph of

$y = 2^x$

for values of x from –4 to 4

Arrange in order, from smallest to largest

5×10^{-1} 10^{-4} 2×10^{-4} 10^{-2}

m is 20% more than n.
n is 15% more than p.

What percentage is m more than p?

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2nd May

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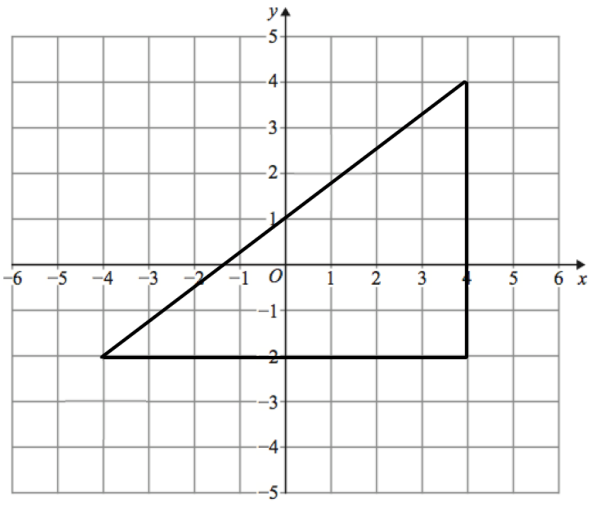
Expand and simplify

$(2x + 11)^2 - (x - 7)^2$



Enlarge the triangle by scale factor –½, using centre of enlargement (2, 0)

How many times smaller is the area of the new triangle than the original triangle?

$(x + 4)^2 \equiv x^2 + 8x + 16$

$(x + 4)^2$

$(x + 4)^2 < 10$

$(x + 4)^2 = x - 3$

Circle the inequality

The price of a car is increased by 20%.
The company sells 18% less cars.

Does the company take more or less money? By what percentage?

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3rd May

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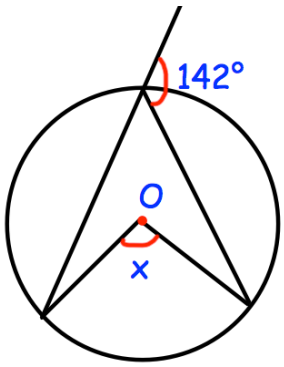
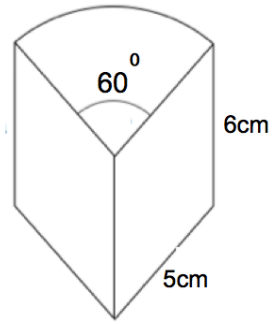


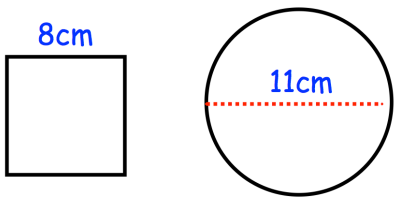
Find x

Simplify $\sqrt{80}$



Calculate the volume of the prism.

Will the square fit inside the circle without touching the circle?



Evaluate

$$\left(\frac{16}{25}\right)^{\frac{1}{2}}$$

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4th May

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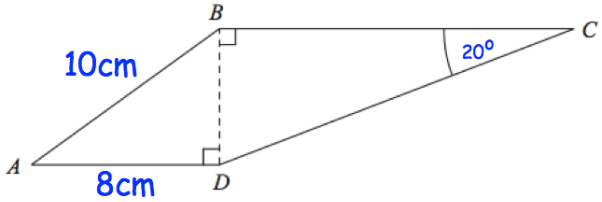
Make v the subject

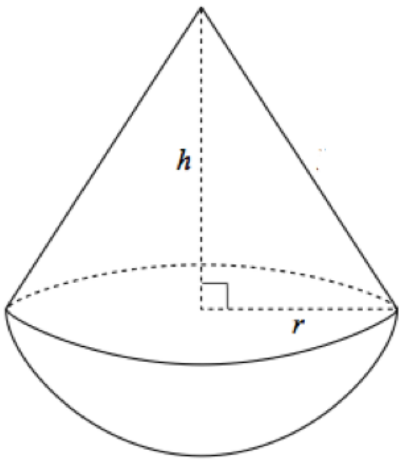
$$E = \frac{1}{2}mv^2$$

Simplify fully

$\sqrt{5} \times \sqrt{15}$



Find BC



The diagram shows a solid made up of a cone and a hemisphere.

The radius of the cone is 3cm.
The height of the cone is 10cm.

Calculate the volume of the solid.

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5th May

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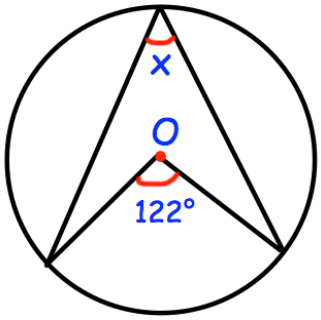
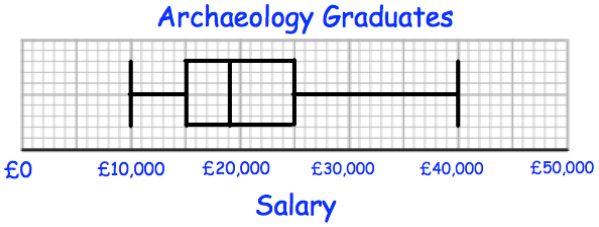
Simplify

$(25w^8y^6)^{½}$



Find x



Write down the value of the median

Harry gets the train to work in the morning.
He works Monday to Friday.
The probability the train is late is 0.2

Find the probability the train is late exactly once.

Make g the subject of 5g + w = ag + c

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6th May

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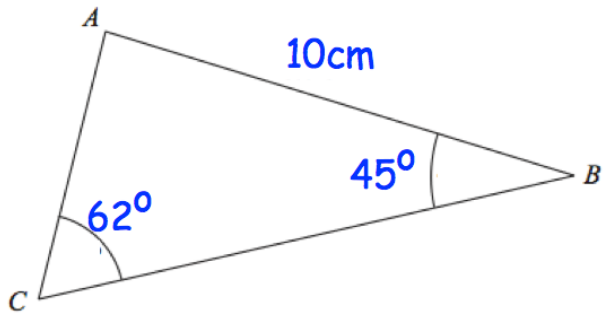
A spinner is spun 600 times.
The relative frequencies of each colour are:

White 0.45
Red 0.35
Green x

How many more times did the spinner land on white than green?

The first flight between Belfast and New York is 40% full.
Each month the number of passengers increases by 3%.
How many months will it be before the flight is full?



Find the length of AC.

Find angle BAC

Find the area of the triangle

Simplify

$$\frac{3x^2 + 7x + 4}{x^2 + 3x + 2}$$

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7th May

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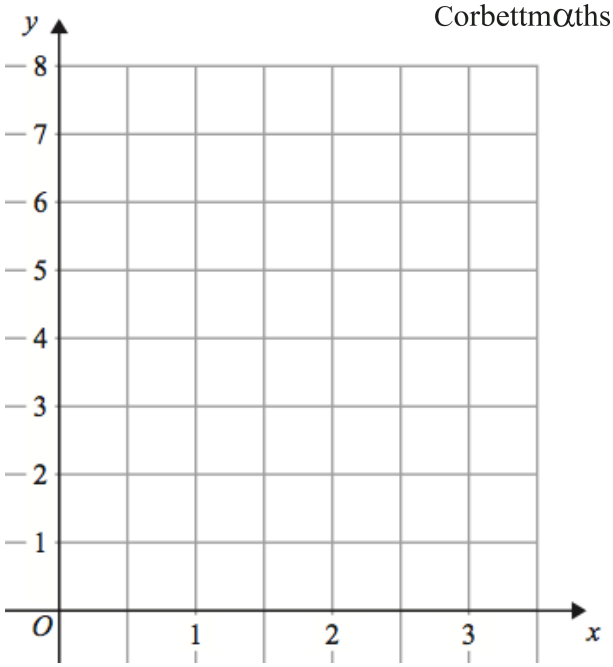
Draw the graph y = 2x + 1



Write down the gradient of a line perpendicular to the one drawn.

Find y

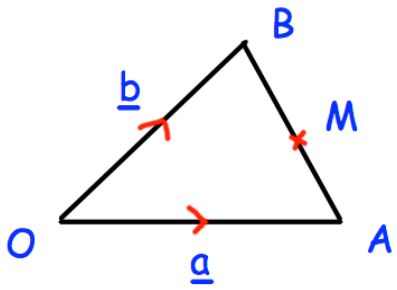
$$7\frac{1}{2} + 1\frac{2}{3} = \frac{3}{8} \div y$$

Helen is making a loaf of bread.
A loaf of bread loses 13% of its weight when it is baked.
Helen wants the baked loaf to weigh 800g.

Work out the weight of the loaf of bread before it is baked.

M is the midpoint of AB.

Find vector OM in terms of **a** and **b**.



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8th May

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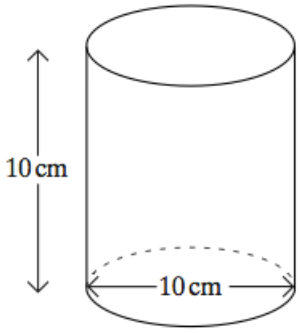


Work out the volume in terms of pi.

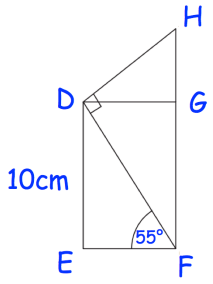
Write 0.434343... as a fraction

A shopkeeper normally sells his goods at 80% above cost price.

In a sale he reduces his prices by 40%.

What percentage profit does he make on goods sold in the sale?

A rectangular playground is 10m longer than it is wide.
The area of the playground is 1400m²
Calculate the width and length of the playground.



DE = 10cm
Angle DFE = 55°
Find the length of FH

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9th May

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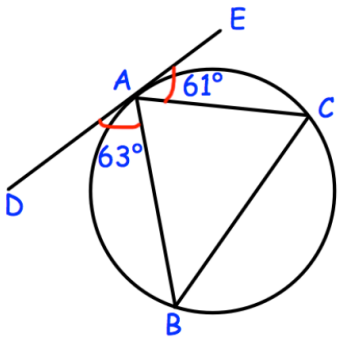
Simplify

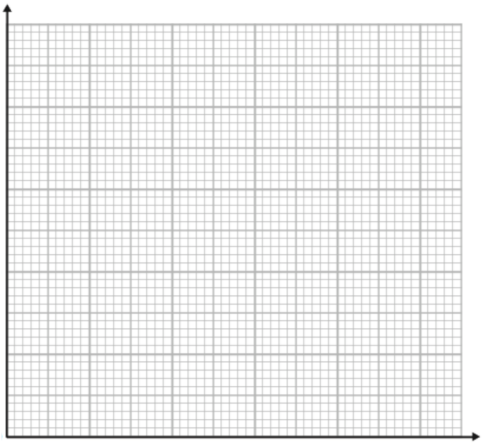
$\sqrt{300}$



Find the size of angle ABC.

length (l cm)	Frequency
$0 < l \leq 8$	16
$8 < l \leq 10$	7
$10 < l \leq 12$	9
$12 < l \leq 16$	6
$16 < l \leq 20$	2

Draw a histogram to show this information.



At a rugby match, the ratio of women to men is 7:3.
The ratio of men to children is 4:5.
What percentage of the people at the rugby match are women?

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10th May

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Work out the value of 150^3

Give your answer in standard form.

Solve the simultaneous equations

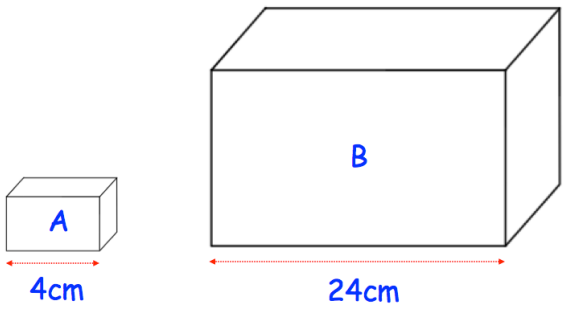
$$x - y = 13$$

$$\frac{2}{3}x + \frac{1}{2}y = -3$$

Liquid A has a density of 0.65g/cm³
Liquid B has a density of 1.4g/cm³

200g of liquid A and 60g of liquid B are mixed for make liquid C.

Work out the density of liquid C.



Shown are two mathematically similar cuboids.
The volume of cuboid B is 1728cm³
Find the volume of cuboid A.

The probability of winning a game is 0.7.

The game is played 3 times.

What is the probability of exactly 2 wins.

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11th May

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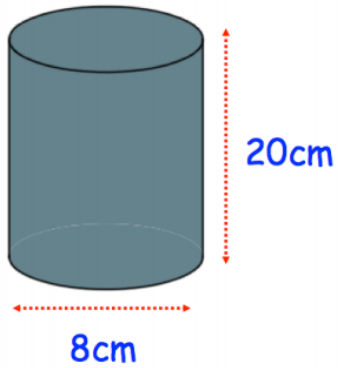
Simplify $\sqrt{2} \times \sqrt{3} \times \sqrt{2} \times \sqrt{3}$

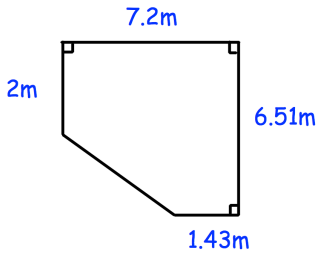
Simplify $\sqrt{10} \div \sqrt{5}$

A lead rod is placed on a table.



The rod is a cylinder with diameter 8cm and height 20cm.
The force exerted on the table is 111.72 newtons.

Work out the pressure in newtons/m²



Find the perimeter of the shape.

Solve $5y^2 + 8y - 100 = y^2 + 4y - 37$

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12th May

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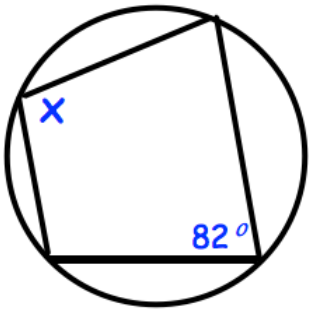
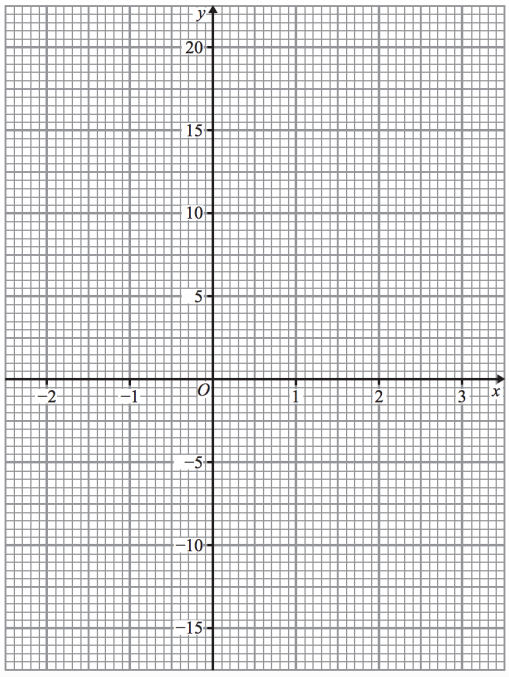


Calculate angle x



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

Use your graph to find an approximate answer to $x^3 - 2 = 0$

Simplify $\sqrt{50}$

Factorise $24y^2 + 19y + 2$

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13th May

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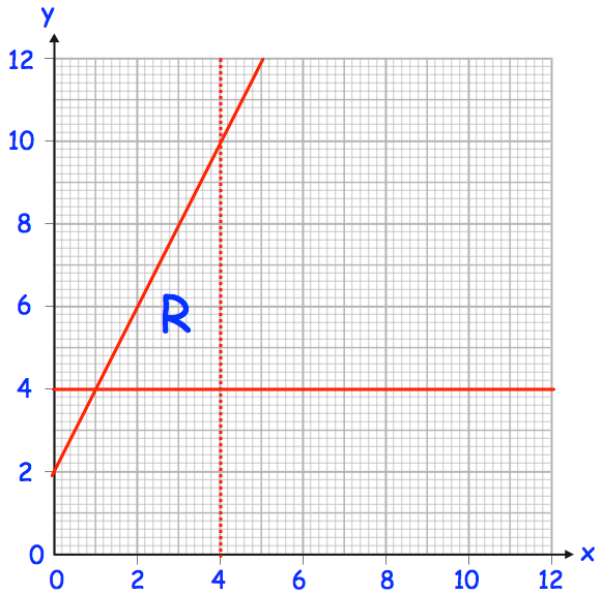
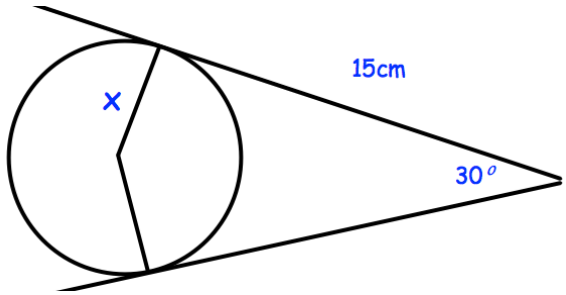
Neil chooses a password for his email account.
His password has 4 letters (lowercase) and then 3 digits (0 - 9)

How many different possible passwords can he choose?



The region labelled R satisfies three inequalities.

State the three inequalities



Calculate x

There are 11 counters in a bag.
4 counters are white and the rest are red.

Patrick chooses a counter at random, notes its colour, then replaces it. He then chooses a second counter at random.

Work out the probability that Patrick chooses two counters that are different colours.

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14th May

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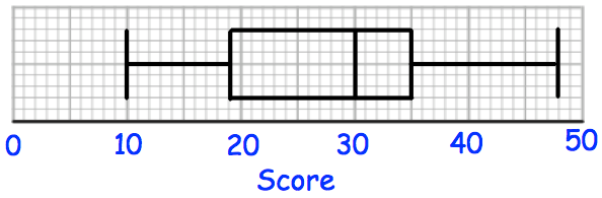
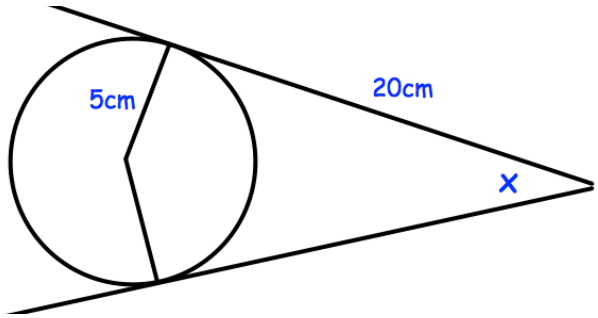


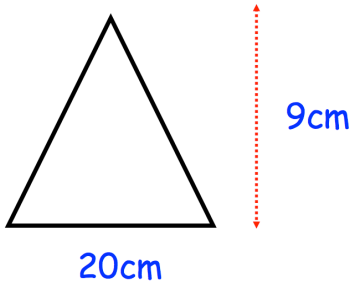
Write down the upper quartile



Calculate angle x

Expand and simplify

$(2x - 1)^3$



Shown is a triangle with measurements given to 1 significant figure.

Calculate the lower bound for the area

Work out

$$\frac{2\pi^3}{5} \div \frac{\pi}{3}$$

simplify your answer

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Name: _____ 5-a-day Higher

15th May

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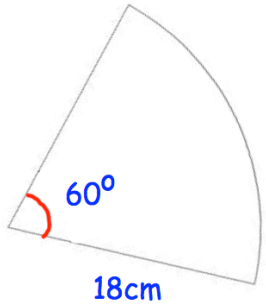
Write as a single power of 4.

$$\frac{4^5 \times 4^7}{4^3}$$

Solve

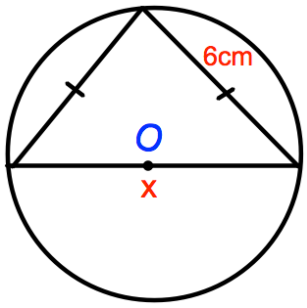
$$3x^2 - 16x + 16 = 0$$



Calculate the perimeter. Leave your answer in terms of pi.

Expand and simplify

$$\sqrt{2}(\sqrt{8} + \sqrt{50})$$



Find x

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Name: _____ 5-a-day Higher

16th May

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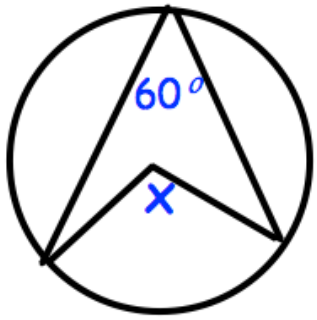


Calculate angle x

The points ABCD are in a straight line.
AB : BC : BD = 1:2:5

The point B is (2, 17.5) and D is (27, 5)

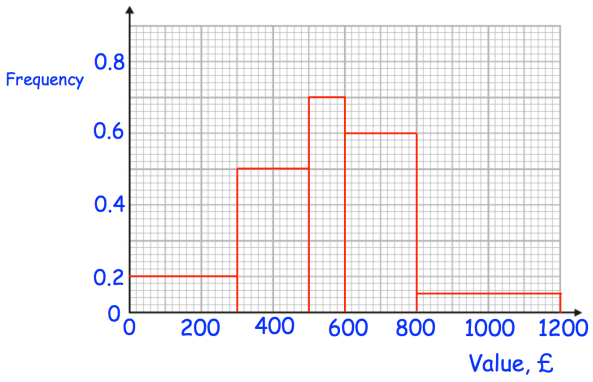
Find the coordinates of point A

Simplify

$$\frac{x^2 - 1}{x^2 + 4x + 3}$$

Christine has drawn a histogram to show the value of some antiques.
She has made some mistakes.

Value, v pounds	Frequency
$0 \leq v < 300$	60
$300 \leq v < 500$	100
$500 \leq v < 600$	70
$600 \leq v < 800$	60
$800 \leq v < 1200$	40



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17th May

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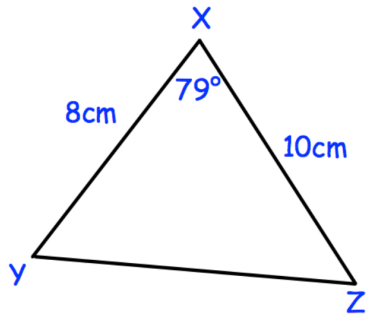
Write as a single power of 4. $(4^5 \times 4^3)^4$	
What is 0.045 as a fraction of 0.03?	
The first three terms of a geometric sequence are: 3, $6\sqrt{2}$, 24	Work out the fourth term.
Calculate the distance between (0, 2) and (10, 5)	
Find the area of triangle XYZ	

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18th May

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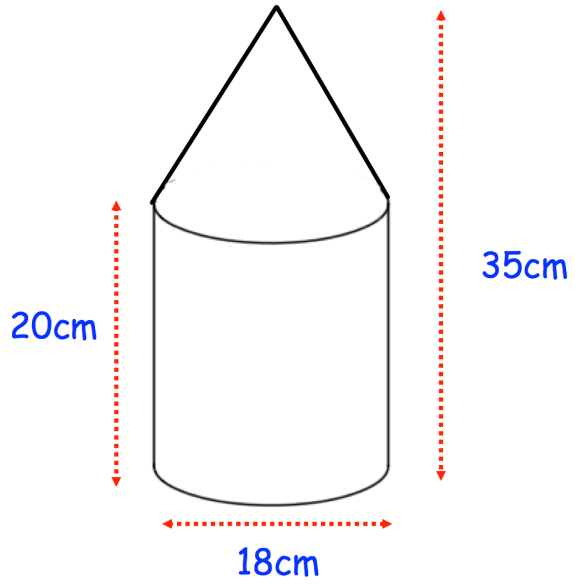
Estimate the cube root of 700	
Make w the subject of $2c - 5w = 9 - cw$	
	Calculate the volume. Give your answer in terms of π
Expand $\sqrt{27}\,(\sqrt{2} + \sqrt{3})$	

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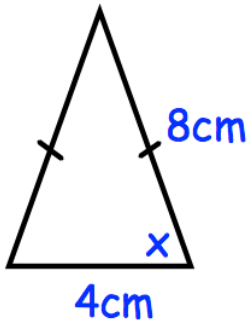
19th May

Corbettmaths



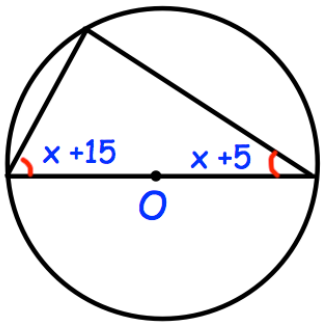
Find x

A rectangular rugby pitch has width 74 metres, measured to the nearest metre.

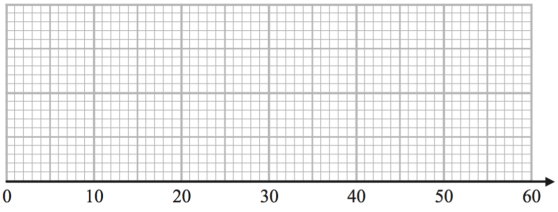
Write down the upper bound of the width of the pitch.

The length of the pitch is 115 metres, measured to the nearest 5 metres.

Work out the upper bound for the perimeter of the pitch



Find x



A puzzle is completed by 120 students.
The quickest time was 8 seconds.
90 of the students took less than 40 seconds.
The median and interquartile range are equal.
The range is double the interquartile range. Draw a possible box plot for this information

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Name: _____ 5-a-day Higher

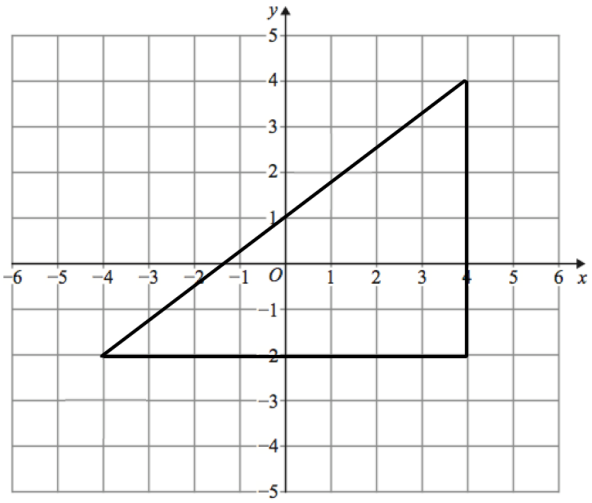
20th May

Corbettmaths

$125^{\frac{2}{3}}$

A bag contains red, white, green and pink sweets.
The ratio of red sweets to pink sweets is 3:7.
The ratio of white to green sweets is 2:11.
The ratio of green to red sweets is 1:3.

Work out the smallest possible number of sweets in the bag.



Enlarge the triangle by scale factor –½, using centre of enlargement (2, 0)

Make w the subject

$$g = \frac{w}{w - 5}$$

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Name: _____ 5-a-day Higher

21st May

Corbettmaths

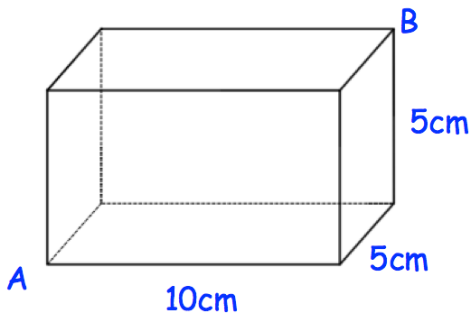
Expand

$(x + 2)(x + 3)(x + 6)$

Simplify $(\sqrt{10})^4$

Simplify $2\sqrt{3} \times 3\sqrt{5}$

Estimate $50^{\frac{3}{2}}$



Work out the distance AB.

Factorise $6w^2 - 7w - 10$

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Name: _____ 5-a-day Higher

22nd May

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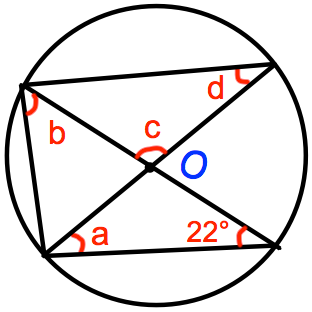
Make y the subject

$y + 3 = x(y + 2)$



Find a

Find b

Find c

Find d

Write down a value of n such that

6.4×10^n

is a cube number

20 students sit a test.

The mean score of the 6 boys is 32 marks.
The mean score of all 20 students is 40 marks.

Work out the mean score of the girls

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23rd May

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$49^{\frac{1}{2}}$

Solve

$4x^2 - 25 = 0$

Simplify

$$\frac{5x^2 - 13x + 8}{x^2 - 1}$$

Number of goals	0	1	2	3
Probability	0.4	0.3	0.2	0.1

What is the probability David scores in two consecutive games?

$xy = a$ where a is a constant

Select the correct statement

y is directly proportional to x

x is directly proportional to y

y is directly proportional to $\frac{1}{x}$

y is inversely proportional to $\frac{1}{x}$

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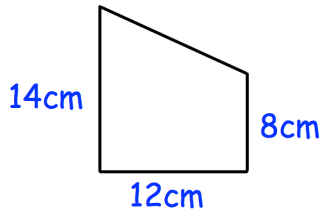
24th May



A frame is made from wire.
The frame is a trapezium
Calculate the total amount of wire needed to make the frame.

Give your answer to 1 decimal place.

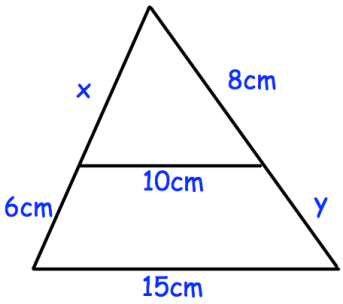
The equation below can have irrational or rational solutions.

$$5x^2 = \frac{1}{a}$$

Write down a value for **a** which gives rational solutions.

Write down a value for **a** which gives irrational solutions.

Write down a value for **a** which gives no solutions.



Find x and y.

Calculate bearing of A from B.

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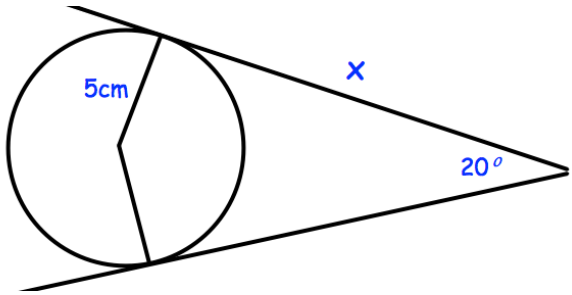
In 2014 the value of a house was £180,000

The value of the house increases by 5% in the first year and 11% for the next 3 years

Work out the value of the house in 2018



Calculate the length of x.

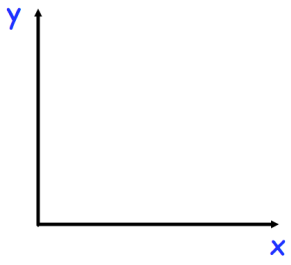
Solve

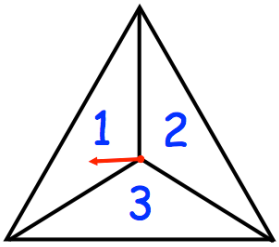
$$5x^2 - 11x + 2 = 0$$

Sketch the graph of

$y = 0.5^x$

for x ≥ 0





The spinner is spun twice.
A score is found by adding the two numbers together.
Find the probability of a score of 4

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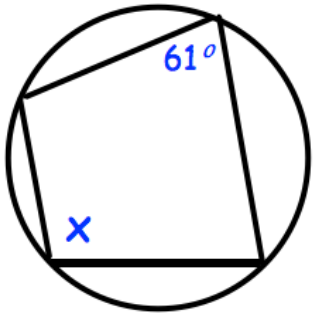
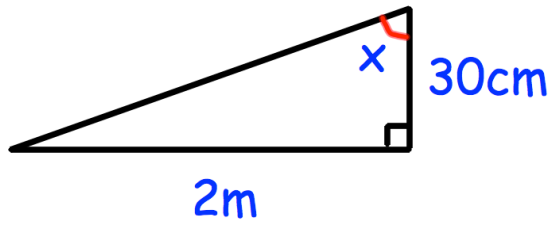


Calculate angle x

Solve using the quadratic formula, to 1 decimal place.

$x^2 - x - 10 = 0$



Find x

Find the equation of the straight line through the points (1, 12) and (3, 8).

The point (c, 10) lines on the same line.
Find c

Work out

$16^{1.5} + 8^{0}$

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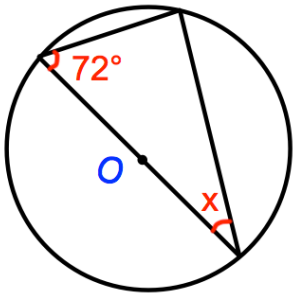

Find x

Derek drives to a football match
He drives the first 10 miles in 20 minutes.
He then drives at 55mph for 30 minutes.

The information below was found in his car manual

Average Speed	Miles per gallon
Less than 50 mph	55
50 to 60 miles per hour	50
More than 60 mph	45

Work out how much petrol he used in total

He completed the return journey at 70mph.
How much petrol did he used in the return journey?

Convert $2.4m^2$ into mm^2

Give your answer in standard form.

A and B are positive numbers.
A is inversely proportional to B.
When A = 4, B = 100.

Find the value of A when B = A.

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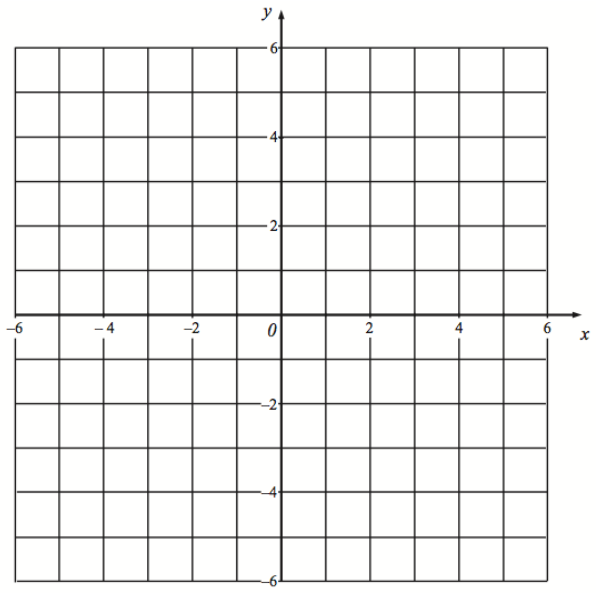
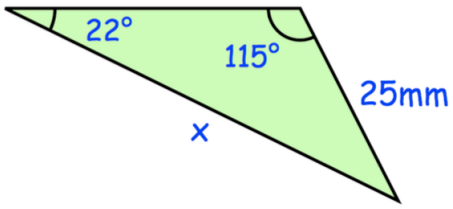
Dara writes down a 4 digit even number.
The first digit is 7
The third digit is prime

How many possible numbers are there?

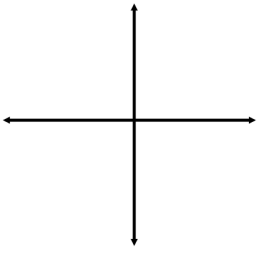


On the grid, label the region that satisfies all three of these inequalities

$x < 3$ $y > -3$ $y < 2x$



Find x



Sketch $y = \frac{1}{x}$ where $x \neq 0$

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The base of a pyramid has n sides. Write an expression for the number of vertices the pyramid has.	
Solve $\frac{4x+9}{15} - \frac{x-3}{5} = 1$	
25 boys and 5 girls sit a class test. The mean mark for the whole class is 82. The mean mark for boys is 84. Work out the mean mark for the girls	
Megan has drawn a picture with triangles and rectangles. Some shapes are red and the others are blue. The ratio of red to blue shapes is 4:5 The ratio of red triangles to red rectangles is 1:3 The ratio of blue triangles to blue rectangles is 3:7 What fraction of all the shapes are triangles?	

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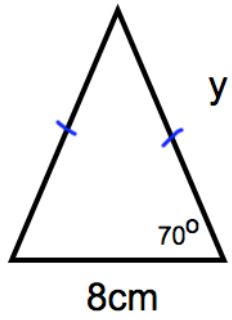
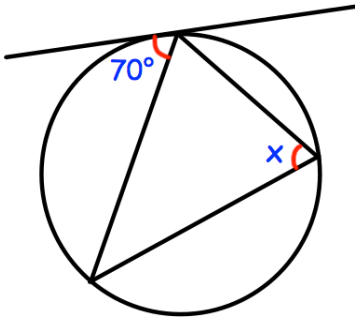
Simplify $4\sqrt{3} \times 2\sqrt{5}$



Calculate y

Write 0.125252525... as a fraction



Find x

A cone has a volume of 80cm³
The radius of the cone is 3cm.

Work out the height of the cone.

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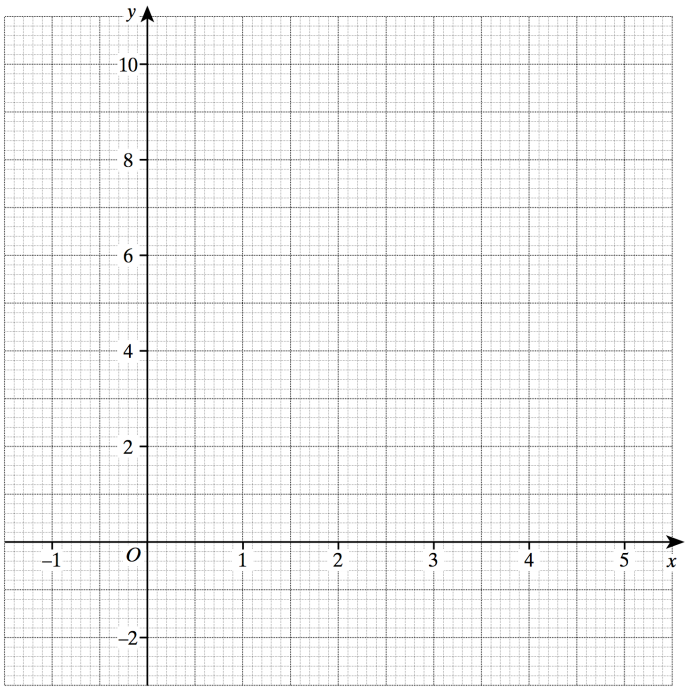
Megan is going to drive 160 from Redville to Castletown.
There are road works for 15 miles of the journey.
Megan thinks that her average speed will be 40mph where there are road works and 65mph for the rest of the journey.
Work out how long the journey should take.



Draw $y = x^2 - 4x + 3$

Write down the coordinates of the turning point of the graph

Find an estimate for f(0.5)

Find estimates for the roots of f(x) = 4

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