MATHS PASSPORT

PASSPORT
FIVE

Higher

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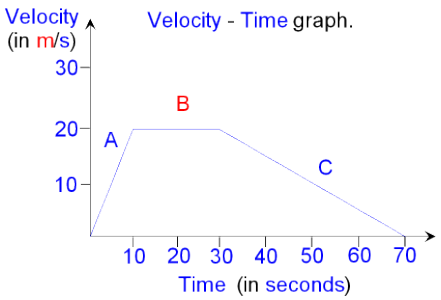
Contents

Number

TOPIC	VIDEO	PRACTISE	
Area underneath a Curve To be able to calculate the area underneath a curve to estimate distance travelled.	https://goo.gl/i5gkku	https://goo.gl/QW6H01	

Exam Question

Calculate the distance Travelled.



Inverse Proportion To be able to calculate the formula for inverse proportion	http://goo.gl/QvDIbw	https://goo.gl/vBOmMI	

Exam Question

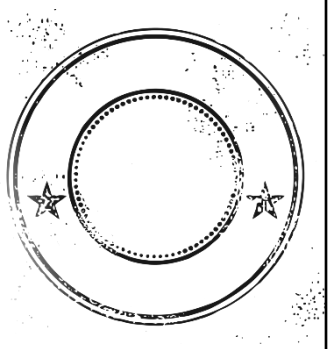
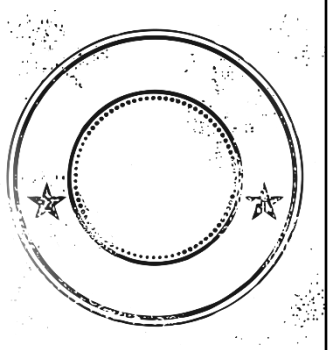
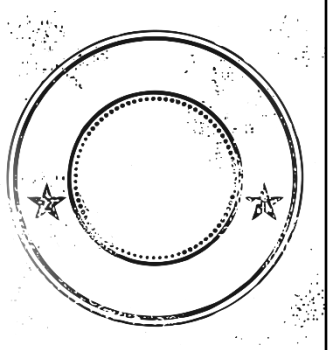
y is inversely proportional to x squared.
Express y in terms of x, when $x = 3$ and $y = 18$.

Rationalising Surds To be able to rationalise the denominator of a surd.	http://goo.gl/7YNfSS	http://goo.gl/PfS4fi	

Exam Question

a) $\frac{5}{\sqrt{7}}$ b) $\frac{2\sqrt{3}}{\sqrt{5}}$ b) $\frac{\sqrt{6}}{4+3\sqrt{2}}$

Algebra

TOPIC	VIDEO	PRACTISE	
Solving Quadratics To be able to solve quadratic equations by factorising.	http://goo.gl/CQWt35	http://goo.gl/d77fd7	
Exam Question Solve for the values of x. a) $x^2 + 7x + 12 = 0$ b) $2x^2 - 7x - 15 = 0$			
Change the subject To be able to change the subject of a formula when needing to factorise.	http://goo.gl/9aAET2	http://goo.gl/OOs2bi	
Exam Question Change the Subject for x. a) $a(x + p) = bx + t$ b) $\frac{p}{x+t} = \frac{y}{x+t}$			
Simultaneous Equations To be able to solve simultaneous equations by the substitution method.	http://goo.gl/T6nvTQ	http://goo.gl/8dbF2p	
Exam Question Solve the equations for both x and y. a) $y + x = 3$, $x^2 + y^2 = 5$ b) $y = 2x + 4$, $4x^2 + 4 = y$.			

Algebra

TOPIC	VIDEO	PRACTISE	
Algebraic Proof To be able to apply the rules of algebra to prove when a statement holds true.	https://goo.gl/gRvEyN	https://goo.gl/y0ZnKe	

Exam Question Prove algebraically that the sum of the squares of any two consecutive even numbers is always a multiple of 4.

TOPIC	VIDEO	PRACTISE	
Identities To be able equate the LHS and RHS to find the missing values of identities.	https://goo.gl/OKcFvQ	https://goo.gl/o4Zf82	

Exam Question

Find the Values of a and b.

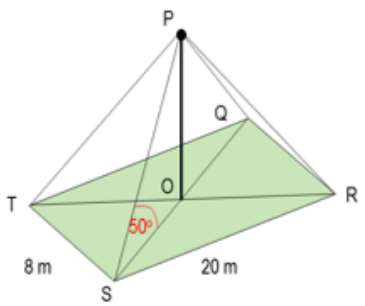
$$3ax + 7 + 5(x - b) \equiv 2 - x$$

Shapes and Measures

TOPIC	VIDEO	PRACTISE	
3D Trigonometry To be able to apply the rules of trigonometry to find a missing length of 3D Shapes.	http://goo.gl/fggZn8	http://goo.gl/MxSWPI	

Exam Question

Calculate the height of the may pole OP.

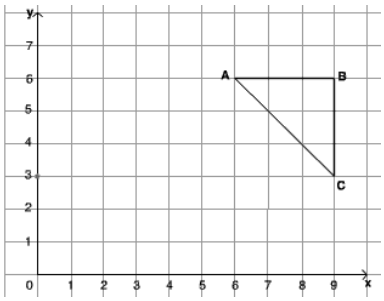


Shapes and Measures

TOPIC	VIDEO	PRACTISE	
Enlargement To be able to enlarge a shape with a negative S.F from a CoE.	http://goo.gl/5X7u6a	http://goo.gl/ljkZXM	

Exam Question

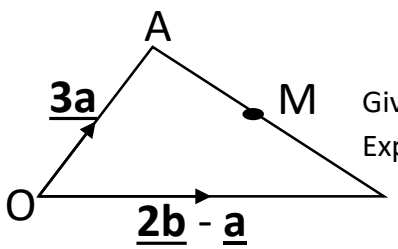
Enlarge shape ABC by the scale factor of -1 from the centre of enlargement (5,4).



Vectors To be able to use vector notation including how to calculate midpoints and ratios.	http://bit.ly/1L8UqGv	https://goo.gl/Ip8Po6	

Exam Question

Express $\overrightarrow{AB}$ in terms of **a** and **b**.

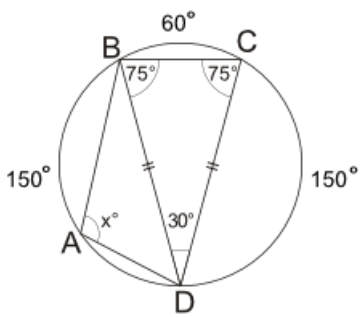


Given that M is the mid point of the line AB.
Express $\overrightarrow{AM}$ in terms of **a** and **b**.

Circle Theorems To be able to apply the circle theorems to find the unknown angles.	http://goo.gl/3rpkdp	http://goo.gl/sp8JCe	

Exam Question

Find the value of x.



Statistics

TOPIC	VIDEO	PRACTISE	
Probability of Dependent Events To be able to use probability trees to calculate dependent probabilities.	http://goo.gl/ja1oNh	https://goo.gl/xz4frh	

Exam Question

A box contains 6 red marbles, 10 yellow marbles and 8 orange marbles. If you pick two without looking, what is the probability that both will be yellow?

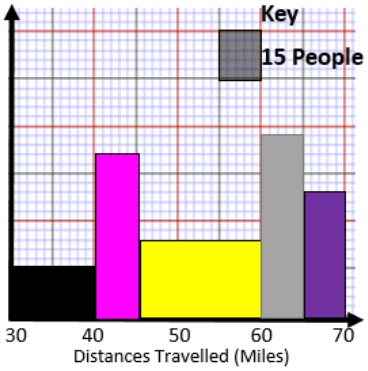
Histograms To be able to accurately interpret a histogram.	http://goo.gl/BvzG5V	http://goo.gl/hSJHQK	

Exam Question

a)How many people travelled fewer than 50 miles?

b)How many people travelled between 35 and 50 miles?

c)How many people **didn't** travel between 55 and 65 miles?



Reverse Averages To be able to calculate a list of numbers when given information about the averages.	https://goo.gl/8RVvbM	https://goo.gl/UNt7ns	

Exam Question A list of five single digit numbers has a median of 7, a mode of 5 and a range of 4. What are the five numbers?

Number

Evaluate the following:

a) 4^0

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

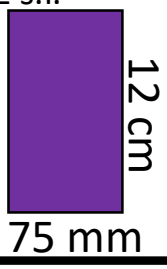
c) $64^{\frac{1}{2}}$

d) 3^{-2}

There is a 45% sale.
How much did the doll originally cost?

You buy a new car for £2,500. Your car depreciates in value by 10% in the first year and 5% each year after. How much is it worth after 4 years?

What is the maximum and minimum areas of this rectangle? Each Length has been rounded to 2 s.f.



Write the following as fractions.

a) 0.77777777……

b) 0.758758758...

c) 0.542424242…..

Simplify the following

a) $\sqrt{24}$

b) $\sqrt{5} \times \sqrt{7}$

c) $(\sqrt{3}+4)(\sqrt{3}-2)$

The time, T in seconds, it takes a water heater to boil some water is directly proportional to the mass of water, m kg, in the water heater. When m=250 and T=600. **Find T when m=400.**

Rationalise the denominator.

a) $\frac{3}{\sqrt{5}}$

b) $\frac{2}{3-\sqrt{5}}$

Algebra

Find the midpoint of the following coordinates.

(-4,6,10)

(10,-8,6)

Express $x^2 + 6x - 2$ in the form $(x + p)^2 + q$.

Find the value of p and q.

Use the quadratic formula to solve.

$$x^2 - 4x - 8 = 0$$

Solve the following pair of simultaneous equations.

$$y = x^2 - 1$$
$$y = 5x - 1$$

Factorise the following expressions:

a) $4x + 20$

b) $3y^2 + 12y$

c) $x^2 + 4y - 21$

The equation of a line is

$$y = 2x + 5$$

Write the equation of a line that is:

a) Parallel to $y = 2x + 5$ through the point (3,4).

b) Perpendicular to $y = 2x + 5$ through the point (-2,5).

Show that

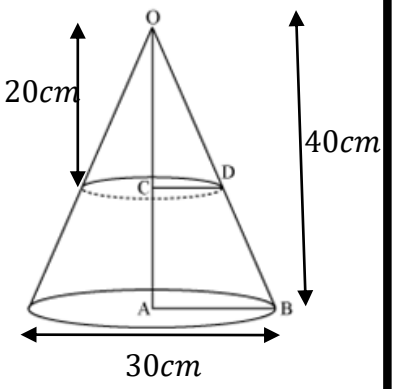
$$\frac{4}{a + a^2} \times \frac{a^3 - a}{ab} = \frac{4(a - 1)}{ab}$$

Make x the subject of the formula.

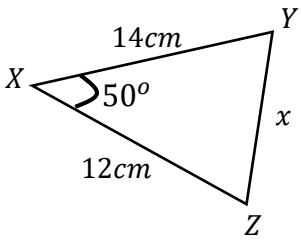
$$y = \frac{x + 2a}{x - a}$$

Shapes and Measures

Calculate the volume of the frustum.

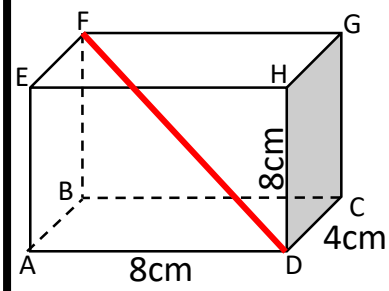


Find the missing length x.

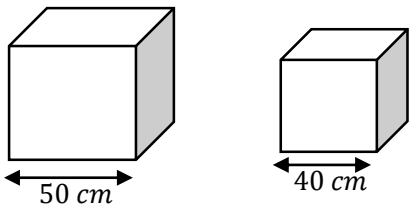


Calculate the area of the triangle.

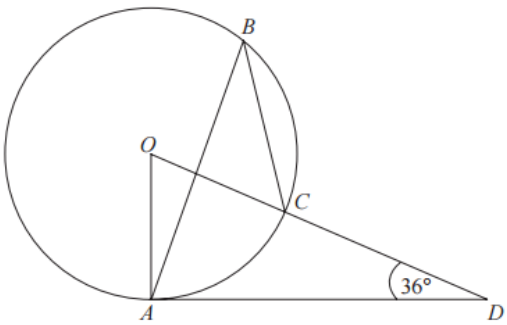
Calculate the length of the line DF.



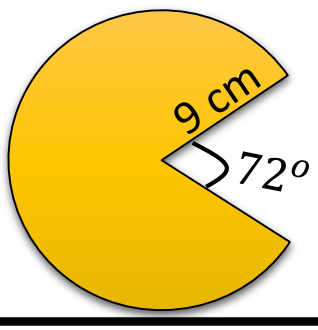
Two boxes are mathematically similar. It takes $3.27m^2$ of paper to wrap the large box. Calculate the amount of paper needed to cover the smaller box.



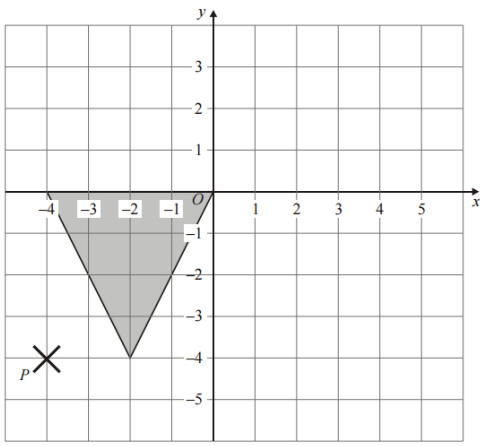
Calculate the size of the angle ABC.



Calculate the area and perimeter of Pacman.



Enlarge the shaded triangle by a scale factor of $\frac{1}{2}$.



Statistics

In a summer fete there are prizes on the tombola game to be won. Calculate the probability of winning each prize.

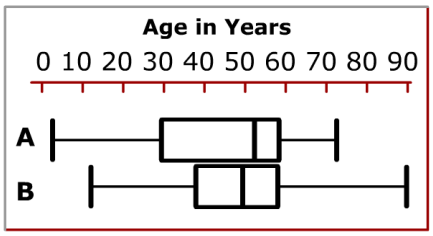
Prize	Probability
Chocolates	$3x$
Bubble Bath	$8x$
Toys	$4x$
Other	$5x$

There are 7 counters in a bag, 5 blue and 2 green. If select a counter and then pass it to my friend to hold while I select a second counter. What is the probability of me selecting two of the same coloured counters?

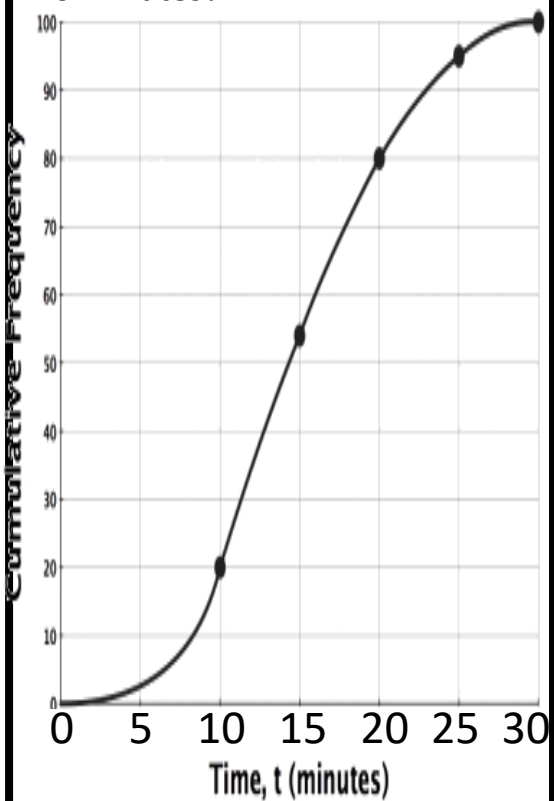
Calculate the mean from the table.

Height (cm)	Frequency
$0 < h \leq 10$	9
$10 < h \leq 20$	7
$20 < h \leq 40$	8
$40 < h \leq 50$	6

Make comparisons between the ages at two separate golf clubs.



How many people are faster than 20 minutes?



Draw a histogram

Height (cm)	Frequency
$0 < h \leq 10$	12
$10 < h \leq 30$	14
$30 < h \leq 50$	8
$50 < h \leq 60$	6

How many objects were taller than 40cm?

A coin and a dice are thrown at the same time. Calculate the probability I get a head and an even number.

GCSE Revision

Available	Tier	Grades
Passport One	Foundation	1-4
Passport Two	Foundation	3-4
Passport Three	Foundation/ Higher	4-5
Passport Four	Higher	5-6
Passport Five	Higher	7-9

Exam Tips

1) Highlight key words and measurements in the exam questions with a yellow highlighter.
E.g. 3 significant figures.

2) Show all of your working out. Whatever you type into your calculator should be written down as well.

3) Make sure your working out is clear by using sub headings if necessary.

4) Remember your units of measure on answers to the question.

5) Remember you can sometimes break a task into separate parts by using the sentences.

6) Make sure you know how to reset your calculator and check it is in degrees mode.