Taverham Sixth Form
One vision. Our passion. Your future.

Essential Topics

Core Maths

Name .....

Skills you should have

Below is the list of the skills you should be confident with before starting the core maths course:

Basic Number (calculator allowed)

- fractions of an amount
- the four operations with fractions
- percentages of an amount
- percentage change
- reverse percentages
- calculations with money and time

Basis Shape (calculator allowed)

- area of rectangles, triangles, parallelograms, trapeziums and composite shapes made up of these
- area of circles, parts of circles and composite shapes including these
- volume of cuboids and prisms
- volume of cylinders, spheres and cones
- Pythagoras in 2D and 3D

Basic algebra (calculator allowed)

- use of $y=mx+c$
- gradient of a straight line connecting two different points
- substitution into formulas
- rearranging formulas

Basic Data (calculator allowed)

- calculations of averages
- bar charts, frequency polygons and pie charts
- histograms
- cumulative frequency and box plots

These are all GCSE topics so there is nothing here which you have not already covered.

In this booklet we have four sections of questions to help you keep up to date and give you a head start for the beginning of Year 12. Please complete and bring with you to your first lesson in September.

Section A

These are all questions that you should definitely be able to answer, even if you have to refresh your memory with your books.

Section B

A second set of questions which are slightly harder, but you should be able to have a good go.

Section C

Harder questions. Just see what you can do!

Section D

Some core maths style questions for you to have a look at. You will need to make some estimates about required information yourself (or look things up) to help with section D.

Section A (definitely)

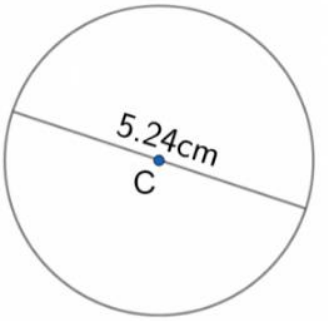
1. (a) Work out the value of $\frac{2}{3} \times \frac{3}{4}$

Give your answer as a fraction in its simplest form .....

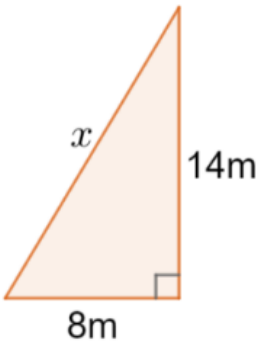
(b) Work out the value of $1\frac{2}{3} + 2\frac{3}{4}$

Give your answer as a fraction in its simplest form .....

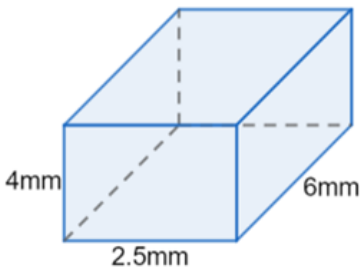
2. This is a circle with centre C. Work out its area to 3 s.f.



3. Work out the length of the missing side



4. Work out the total surface area and the volume



5. Loft insulation reduces annual heating costs by 20%. **After** he insulated his loft, Curtley's annual heating cost was £520. Work out what Curtley's annual heating cost would have been, if he had not insulated his loft.

Section B (should be able to…)

1. The table shows information about the distances walked by 120 students on their way to school one week.

Work out an estimate for the mean distance .....

Distance, *x* (miles)	**Frequency**		
$0 < x \leq 5$	20		
$5 < x \leq 10$	48		
$10 < x \leq 15$	30		
$15 < x \leq 20$	22		
	Total = 120		

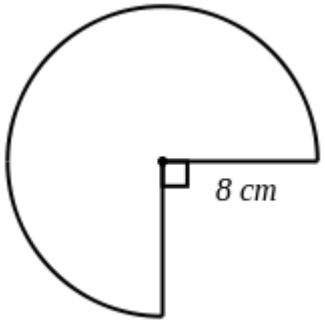
2. This item appeared in a newspaper. Calculate the amount of milk produced by the cows when they listened to classical music.

Cows produce 3% more milk

A farmer found that when his cow listened to classical music the milk it produced increased by 3%. This increase of 3% represented 0.72 litres of milk

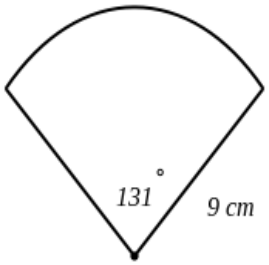
3. Make u the subject of the formula $D = ut + kt^2$ u = ...

4. Find the area of the three-quarter circle, rounding your answer to 3 significant figures

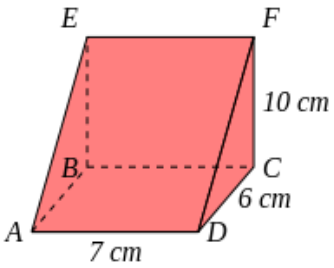


Section C (might be able to…)

1. Find the area of the sector, rounding your answer to 3 significant figures



2. Find the length of DE in the shape pictured below, giving your answer to 3 significant figures



3. Here is some information about the number of books read by a group of people in 2014

Number of books	Frequency	Midpoint	
0 - 4	16	2	
5 - 9		7	
10 - 14	20	12	
15 - 19	10	17	

One of the frequencies is missing. Midpoints are used to work out an estimate for the mean number of books read. The answer is 8.5. Work out the missing frequency.

4. Here is some information about tourism in 2012.

21% of the total spent by tourists in the USA was by Canadians.

34% of tourists in the USA were Canadians.

Work out the average amount spent per Canadian tourist in the USA.

Country visited	Number of tourists	Total spent by tourists ($)
France	8.30×10^7	5.360×10^{10}
USA	6.70×10^7	1.262×10^{11}
Spain	5.77×10^7	5.590×10^{10}

Section D – Core Maths style (have a go!)

1. This music video is 4:41. Estimate how long has been spent watching this video?

The Times estimates that a content creator would earn around $2000 per million views, and YouTube takes 45%. How much has Luis Fonsi earned from this video?

1: LUIS FONSI – DESPACITO FT DADDY YANKEE (5.97 BILLION)

2. A magazine claims that during their life time an average person will drink enough water to fill an Olympic swimming pool. Do you think this could be true?

3. Estimate how many loaves of bread you need to make sandwiches for 30 people. What information do you need? What assumptions have you made?

4. Estimate the number of times a person will blink in one year. What information do you need? What assumptions have you made?