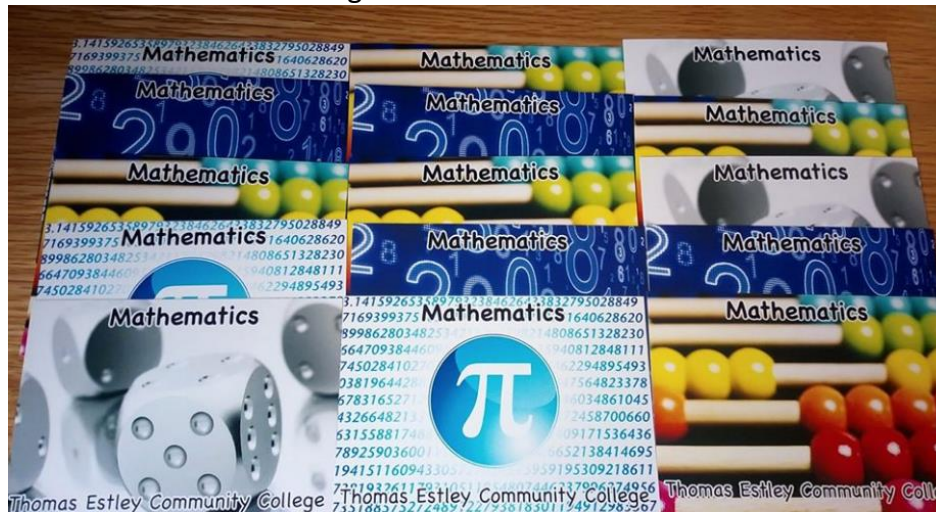


Maths Department

Here are some of the postcards that we have sent home to our pupils to recognise their dedication to their learning:



We have also been able to celebrate the success of our year 10 pupils who took part in the UKMT Intermediate Maths Challenge earlier this year. It is such an achievement to be awarded a certificate in this and we were so proud to receive so many. Special congratulations for Harry Braithwaite and Alex Green who were awarded the best in school certificates.



We have also heard that the UKMT Junior Maths Challenge which was scheduled for April 30th will take place later in the year which is something for our year 8 pupils to look forward to!

As a department, we have tried to set a variety of engaging tasks that will challenge our pupils so that they can continue to make excellent progress in maths. Here are some snapshots from each of our teachers about what they have been doing with their classes.

Students have been accessing video clips explaining how to do skills and then practising these with a mixture of paper based questions and online tasks.

Further exam style practise has also been used with the 'Aiming at Grade ...' booklets the students were given before the lockdown.

Codebreakers and puzzles also provide opportunities to practise key skills.

Improper fractions code breaker

Decipher a groan-inducing joke by finding the missing top-heavy and mixed fractions.

Find the missing improper fractions or mixed numbers below:

	improper	mixed		improper	mixed
A	$\frac{5}{2}$		N	$\frac{11}{2}$	$2\frac{1}{2}$
B		$1\frac{1}{2}$	O	$\frac{7}{2}$	
C	$\frac{3}{2}$		P		$3\frac{1}{2}$
D		$1\frac{1}{2}$	Q	$\frac{5}{2}$	
E	$\frac{20}{2}$		R		$1\frac{1}{2}$
F		$1\frac{1}{2}$	S	$\frac{1}{2}$	
G	$\frac{7}{2}$		T		$2\frac{1}{2}$
H		$3\frac{1}{2}$	U	$\frac{1}{2}$	
I	$\frac{4}{2}$		V		$1\frac{1}{2}$
J		$2\frac{1}{2}$	W	$\frac{17}{2}$	
K	$\frac{8}{2}$		X		$1\frac{1}{2}$
L		$4\frac{1}{2}$	Y	$\frac{3}{2}$	
M	$\frac{12}{2}$		Z		$1\frac{1}{2}$

Use your fractions above to substitute the correct letters into the code below. Do not use a letter twice!

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60

To aid retrieval, our students have continued to complete the end of topic tests. Feedback opportunities via SMHW help students see and correct mistakes

Algebra 16 - Straight Line 2

Objective 1:

a) Work out the gradient of the lines between these points:

(i) A (3, 2) and B (7, 6)
 $\frac{\text{rise}}{\text{run}} = \frac{4}{4}$ gradient = 1

(ii) C (3, 3) and D (9, 7)
 $\frac{\text{rise}}{\text{run}} = \frac{4}{6}$ gradient = 3

b) A straight line L is shown on the grid.

Work out the equation of line L.

$\frac{\text{rise}}{\text{run}} = \frac{8}{2} = 4$
 $y = 4x + 4$

Objective 2:

a) The line L passes through the points (0, 7) and (3, 19).
 Work out the equation of the line L.

$\frac{\text{rise}}{\text{run}} = \frac{12}{3} = 4$ gradient = 4
 (0, 7) - y-intercept
 $y = 4x + 7$

I am so proud of our students for the way they have risen to this challenge and shown the strength of character to succeed. ~ Ms Ducey

Since the schools have closed my students have been focused on their maths from the word go. I have been extremely impressed at how hard they have been working and the quality of the work that they have produced. They have been resilient and asked for help when they've needed it and adapted well to a completely new way of working. It's been a steep learning curve for everyone.

I can't thank the army of mums and dads that must be learning with their children enough. They couldn't do it without you and neither could I! Its been busy!

Year 7 have done some work on Algebra and Experimental Probability.

Year 8 have looked at probability and percentages.

Year 9 have looked at sketching quadratic graphs, harder factorising, completing the square, using the quadratic formula plus a unit of work on Surds!

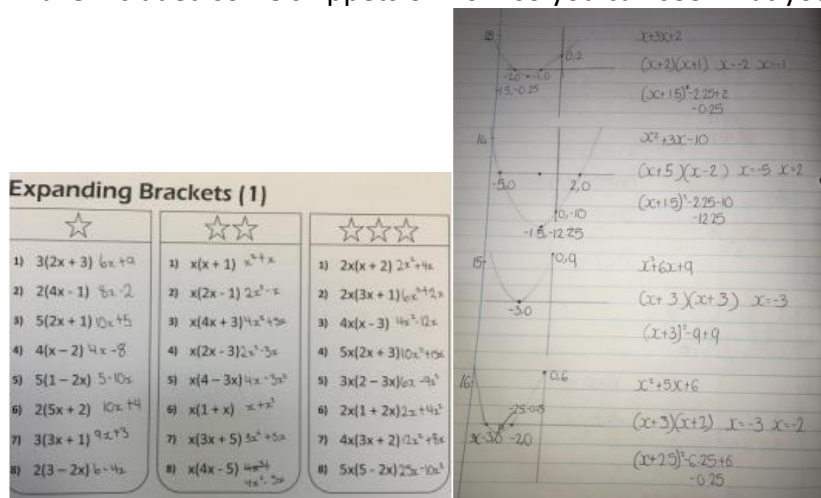
Year 10 have finished a unit of work involving finding the mean, median and mode from Grouped frequency tables, a unit of work on fractions of amounts and a unit on experimental probability.

Year 11 have been doing Exam questions!

I have tried to keep to a normal a lesson structure as possible and tried to strike a balance between computer based study and exercise books. I think its working.

I think we can all agree that home learning is no substitute for being at school but we have to keep ourselves safe and do the best we can.

I have included some snippets of work so you can see what you've all been up to!



I and my family are fit and well and it has been a relief for me to see that my students are safe and well too. Until we are back at school, keep yourselves safe, keep up with your maths and work as hard as you have been doing. No one can ask for more! I miss you all loads!

See you soon.
Simon Gladwin

During these very difficult times, it has been a challenge for us all, as parents, teachers and students alike. However, I must say that the majority of my classes and students have really shone.

I, as their teacher, fully appreciate that mathematics is just one subject of many that the pupils have to study and all subjects are all setting work to do.

I have tried to manage the mathematics that the students do with recapping topics already covered and some new areas.

Teaching new topics is always difficult, without an actual teacher present, as lots of pupils require additional guidance to fully grasp the topic but they are all taking on this fantastic challenge!

Teaching through a laptop is always difficult, and learning on your own is also challenging, but when we all get to school and normality I will have only praise and admiration for all of my classes. They have taken on this challenge and managed their online learning superbly well.

I miss all of my classes terribly and I look forward to the day when we can all be together again in my lovely air conditioned room!

Stay safe and look after yourself and each other.

Mr Norris

I've set a variety of work for pupils, from Hegarty Maths tutorials and question sheets, through powerpoint theory and practice to more-open investigative projects. It's easiest to set skill based to develop their base-level abilities and Hegarty provides a great option for teaching and learning practice. I'm trying to stick mainly to those topics as it is easier to manage, support and assess understanding.

For lower year groups I have set some more challenging task. One group finished school mid-way through constructions so we had to try and finish that off:

Objective 4:

A phone box is located near three houses A, B and C.
The phone box is less than 500m from the railway track.
The phone box is between 300m and 500m from house A.
The phone box is closer to house C than house B.
Shade the region on the map where the phone box could be located.

1cm = 200m

Railway

A • B • C

parallel line 2.5cm
circles radius 1.5cm
perpendicular bisector

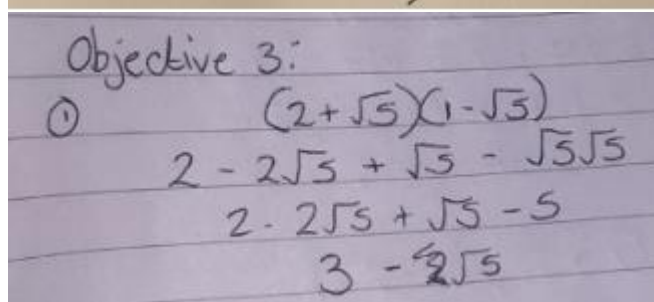
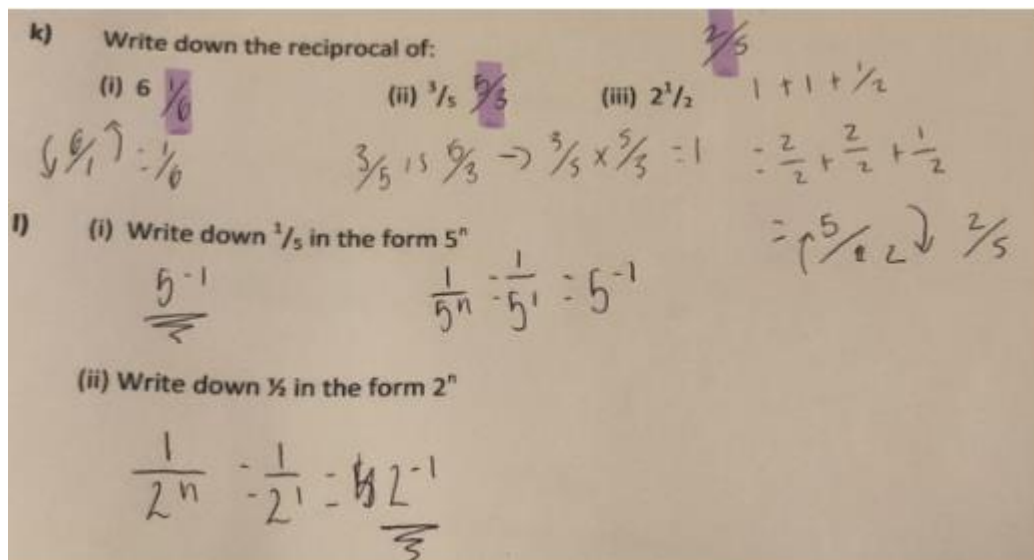
Phone box region

Objective 2:

(c) Construct triangle ABC where $AB = 6\text{cm}$, $AC = 5\text{cm}$ and $BC = 4.5\text{cm}$

most show compass lines

The year 10 top sets have done some excellent work with Indices and Surds lately too.



I've currently got a year 7 and year 9 group investigating the Mathematically-formed artwork from global cultures and looking at the transformations and symmetry occurring there.

I've also done a couple of email based QnA sessions with two year 10 top set classes. That worked really well (chose the audience well) and they asked some great questions about moving forwards and supporting their learning independently.

Take care and I will see you soon.
 Mr Curry

It has been heartwarming to see that during these difficult times, the pupils in my classes have shown their determination to succeed. I cannot begin to describe how impressed I am with their work ethic and the quality of work that they are turning in.

In my year 7 classes, we have been looking at writing and simplifying ratios and theoretical probability. Pupils have done a mixture of hegarty maths tasks and online worksheets as well as completing quizzes and end of topic assessments to aid their retrieval of key information.

Objective 1:
 $a = 4:3$
 $b = 3:1$
 $c = 1:9:3:6$
 $ii = 6:9:6$

Objective 2:
 $d = 1:6:5$
 $ii = 5:1:3$
 $iii = 1:10$
 $iv = 22:7$

Objective 3:
 $e = \frac{7}{12}$
 $f = \frac{3}{9}$ or $\frac{1}{3}$
 $g = 3:1$

Objective 4:
 $h = 1:24$ babies
 $ii = 9$ helpers

Probability (1)

Dice

1. A fair dice is rolled.
What is the probability of rolling:
 (a) 6? $\frac{1}{6}$ (b) 3? $\frac{1}{6}$
 (c) 2 or 3? $\frac{2}{6} = \frac{1}{3}$ (d) even number? $\frac{3}{6} = \frac{1}{2}$
 (e) number greater than 2? $\frac{4}{6} = \frac{2}{3}$

2. A fair dice is rolled.
What is the probability of rolling:
 (a) 1? $\frac{1}{6}$ (b) 2, 3 or 4? $\frac{3}{6} = \frac{1}{2}$ (c) 3 or 5? $\frac{2}{6} = \frac{1}{3}$
 (d) number less than 2? $\frac{1}{6}$

3. A fair dice is rolled.
What is the probability of rolling:
 (a) 1 or 3? $\frac{2}{6} = \frac{1}{3}$ (b) 2, 3, 4 or 5? $\frac{4}{6} = \frac{2}{3}$
 (c) 7? 0 (d) number less than 10? $\frac{6}{6} = 1$

Colours

1. A bag contains four red balls, two green balls and one white ball (RRRR GG WW).
What is the probability of picking:
 (a) red ball? $\frac{4}{7}$ (b) white ball? $\frac{1}{7}$ (c) green ball? $\frac{2}{7}$
 (d) ball which is not white? $\frac{6}{7}$

2. A bag contains three red balls, two green balls and four white balls. What is the probability of picking:
 (a) red ball? $\frac{3}{9} = \frac{1}{3}$ (b) white or green ball? $\frac{6}{9} = \frac{2}{3}$
 (c) ball which is not white? $\frac{6}{9} = \frac{2}{3}$

3. A bag contains four red balls, two green balls and four white balls.
What is the probability of picking:
 (a) red ball? $\frac{4}{10} = \frac{2}{5}$ (b) white, yellow or red ball? $\frac{10}{10} = 1$
 (c) ball which is not white? $\frac{6}{10} = \frac{3}{5}$

Letters

1. A random letter is chosen from INTEGER.
What is the probability of choosing:
 (a) T? $\frac{1}{11}$ (b) G? $\frac{1}{11}$ (c) E? $\frac{1}{11}$
 (d) vowel? $\frac{4}{11}$ (e) consonant? $\frac{7}{11}$

2. A random letter is chosen from RHOMBUS. What is the probability of choosing:
 (a) R? $\frac{1}{7}$ (b) U? $\frac{1}{7}$ (c) T? $\frac{2}{7}$
 (d) vowel? $\frac{3}{7}$ (e) consonant? $\frac{4}{7}$

3. A random letter is chosen from PARALLEL. What is the probability of choosing:
 (a) P? $\frac{1}{8}$ (b) A? $\frac{2}{8} = \frac{1}{4}$ (c) P or A? $\frac{3}{8}$
 (d) vowel? $\frac{4}{8} = \frac{1}{2}$ (e) not a vowel? $\frac{4}{8} = \frac{1}{2}$

My year 8 classes have been looking at direct and inverse proportion, calculating with decimals, listing outcomes and finding missing angles.

Dividing by Decimals
 Videos 92 on www.carljetmaths.com

Apply

Question 1: A sweet cost £0.04. How many sweets can I buy for £20?
 $\frac{20}{0.04} = 500$

Question 2: Mia has 20 metres of ribbon. She is cutting it into pieces that are 0.8m long. How many 0.8m pieces of ribbon will she have?
 $\frac{20}{0.8} = 25$

Question 3: Yasmin has £17 in five pence pieces. How many five pence pieces does she have?
 $\frac{17}{0.05} = 340$

Question 4: Find the missing numbers.
 $0.4 \times \boxed{52} = 20.8$
 $0.7 \times \boxed{63} = 45$

Question 5: A teacher is placing textbooks that are 2.5cm thick on a bookshelf. The teacher wants to place 60 textbooks on the shelf. The bookshelf is 160cm long. Does the teacher have enough room on the bookshelf for the textbooks?
 $2.5 \times 60 = 150$ cm. Yes, there is room for 60 Textbooks.

Question 6: A grain of rice has a mass of 0.015g. How many grains are there in 300g of rice?
 $\frac{300}{0.015} = 20000$

Question 7: A type of pebble has a mass of 0.8g. How many pebbles are there in 40kg?
 $\frac{40000}{0.8} = 50000$

Question 8: Use approximations to estimate the answer to the following:
 (a) $\frac{9.892}{0.502} \approx 20$
 (b) $\frac{6.97 \times 201.82}{0.391} \approx 3500$
 (c) $\frac{1802.7 - 397.2}{0.699} \approx 2000$

2020

Monday 6th April

Proportion: Recipes

Question 1: Recipe

How much of each ingredient must be needed to make:

a) 16 Scones

200g flour
 30g caster sugar
 50g butter
 140ml milk
 2 eggs

200 : 8 = 25 x 16 = 4000g flour ✓
 30 : 8 = 3.75 x 16 = 60g Caster Sugar ✓
 50 : 8 = 6.25 x 16 = 100g butter ✓
 140 : 8 = 17.5 x 16 = 280 ml Milk ✓
 2 : 8 = 0.25 x 16 = 4 eggs ✓
 (Don't forget to round down to 2)

b) 4 Scones

25 x 4 = 100g flour ✓
 3.75 x 4 = 15g Caster Sugar ✓
 6.25 x 4 = 25g butter ✓
 17.5 x 4 = 70 ml Milk ✓
 0.25 x 4 = 1 = 1/2 an egg ??? ✓

My year 9 classes have been building on their previous learning by looking at the equations of straight lines and also complex substitution. They created posters of their learning to aid their revision before their end of topic test.

y
This is the variable value of y on the graph and is the subject of the formula.

m
This is the gradient of the straight line.

x
This is the variable value of x on the graph.

c
This is the point where the line will cross the y-axis.

$y = mx + c$

gradient y-intercept

{ Parallel lines }
have the same gradient

Straight Line Graphs

$y = 2x + 1$

x	0	1	2
y	1	3	5

When $x = 0$,
 $y = 2x + 1$
 $= (2 \times 0) + 1 = 1$

When $x = 2$
 $y = 2x + 1$
 $= (2 \times 2) + 1 = 5$

Coordinates:
(0, 1)
(1, 3)
(2, 5)

Horizontal lines are always "y = a number"

Vertical lines are always "x = a number"

Straight line graphs

how to plot a straight line graph:

gradient $m = 2$
intercept $c = 6$

$y = 2x + 6$

always write your line equations

you need to have your table of values

x	-2	0	2
y	-2	6	10

$y = mx + c$

$m \times x = \text{number} \times x (0)$

$c = y\text{-intercept}$ (where does the line intercept the y line)

make sure your points are clear and precise

make sure you're line is straight

example: $y = 2x + 1$
 $-2 \times 3 = -6$
 $-6 + 1 = -5$
 then repeat with all other x values.

The gradient is how steep the line is and how many squares the line is on the rise.

Year 10 have been looking at sequences such as the Fibonacci sequence and geometric progressions. In addition to this, they have also been looking at complex ratio problems such as combing two ratios and writing ratios in the form 1:n.

Corbett Maths
Triangular Numbers
Video 229 on www.corbettmaths.com

Examples

Workout

Click here

Scan here

Question 1: Write down the first 10 triangular numbers.
1, 3, 6, 10, 15, 21, 28, 36, 45, 55

Question 2: From the box, list any triangular numbers.
3, 10, 36

Apply

Question 1: Write down two numbers that are triangular numbers and square numbers.
1, 36

Question 2: Hannah adds together two consecutive triangular numbers. What kind of number does Hannah get?
A square number

Question 3: At a party, everybody shakes hands with each other, once. Work out how many handshakes there are in total, if there are

(a) 4 people at the party 6

(b) 5 people at the party 10

Maths assessment. (Ratio)

a) $25 : 35 \rightarrow \div 5$ $72 : 45 \rightarrow \div 9$ Simplify:
 $5 : 7$ $8 : 5$

b) Write the following ratios in the form $1 : n$
 $4 : 28$ $5 : 42$
 $1 : 7$ $1 : 8.4$

(1) Tom, Tim and Bill share £60 in the ratio 2:3:5
How much does each person get?
Tom = £12
Tim = £18
Bill = £30

A bag contains red, yellow and green beads.
The ratio of red to yellow is 2:3.
The ratio of yellow to green is 3:4.
Find the ratio of red to yellow to green beads.
 $2 : 3 \rightarrow 6 : 9$ $3 : 4 \rightarrow 9 : 12$ answer: 6 : 9 : 12
 $6 : 15$ $15 : 20$ $6 : 15 : 20$

Year 11 have been practising exam questions just as they would have done if they were at school. They have also been revising key topics.

Circle Theorems

(1) $\angle OAD = 90^\circ$ as a radius meets at tangent at 90°
 $\angle AOD = 180 - (90 + 36)$
 $= 54^\circ$ as there are 180° in a triangle

(2) $\angle ABC = 54 \div 2$
 $= 27^\circ$ as angle at circumference is half of angle at centre

(3) $x = 70 \times 2$
 $= 140^\circ$ as angle at centre is double angle at circumference

(4) $y = 180 - 70$
 $= 110^\circ$ as opposite angles in cyclic quadrilateral add to 180°

Pythagoras' Theorem and Trigonometry

(1) $\sin \theta = \frac{\text{opp}}{\text{hyp}}$
 $\sin \alpha = \frac{3}{10}$
 $\alpha = \sin^{-1}\left(\frac{3}{10}\right)$
 $= 17.45760312 = 17.46^\circ$ (2dp)

(2) $y = \sqrt{10^2 - 3^2}$
 $= \sqrt{71} = 8.426149773 = 8.43$ (2dp)

(3) $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$
 $\cos A = \frac{11^2 + 12^2 - 15^2}{2 \times 11 \times 12}$
 $= \frac{5}{33}$
 $A = \cos^{-1}\left(\frac{5}{33}\right) = 81.28525798 = 81.29^\circ$ (2dp)

I am missing all of my pupils hugely and I cannot wait until we are back at school so that I can see you all again. Please stay safe and keep on working as hard as you have been. I am so proud of how well you're doing.

Take care,
Mrs Taylor