Gifted, Talented and the More Able in Mathematics

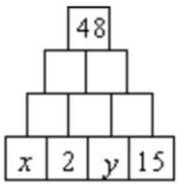
Opportunities available within the Department.

- A maths support sessions are ran every lunchtime
- Buddy system- helping other students to learn

Opportunities within lessons

There are many leadership roles available within lessons. Hot seating, group leaders, research leaders, Challenge partners, peer teaching. GCSE questions and resources for some Key stage 3 tasks, and A-Level questions for some GCSE topics.

Questions for Stretch and Challenge

	Stretch and Challenge Task
Year 7	☐Mastery- measure and name: Directions: **Circle the name of the type of angle below.** 1. Right Acute Obtuse Straight 2. Right Acute Obtuse Straight 3. Right Acute Obtuse Straight 4. Right Acute Obtuse Straight ☐ Mastery with greater depth 1) OAAE- "opposite angles are equal" 2) 180DIAT 3) AAAE 4) AAST180 5)AAALT90 6) CCAE 7) 180DOAL 8) PLNM 9) 360DAAP 10) RAAGT360 ☐Mastery Fill in the blanks: $4x + \square - y + 3x = \square x + 6y$ $\square(2a - 3b) = 8a - \square b$ $5\square \times 3x = 15x^2$ ☐ Mastery with greater depth What possible values do x and y have?  Can you construct a 90^0 angle from a point on a line? ☐ Mastery with greater depth Can you construct a 60^0 angle using just a ruler and compass?

Year 8

Sequences

Work out the nth term for the following sequences

i) -36, - 32, -28, -24, ...

ii) 23, 20, 15, 8,.....

iii) 35, 30, 21, 8,.....

(Last two are quadratic with negative n^2)

Algebra

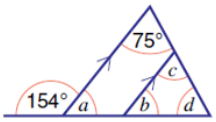
The following shape has a perimeter of 26cm. Find the length of each side.

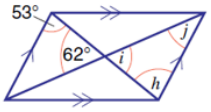
3x - 2

2(x – 5)

Angles and Parallel Lines

Find the missing angles





Year 9

Compound and Simple Interest

1. I invest £3000 and after 2 years my investment is worth £3370.80. What compound interest rate am I getting?

2. I invest £5,000 at 6%pa compounded monthly. How much money will I have after 3 years?

Put these in order starting with the smallest.
You **must** show the value of each number in your working.

$9^{\frac{1}{2}}$ $(-7)^0$ $\left(\frac{1}{8}\right)^{-\frac{1}{3}}$

a) Expand and simplify $(2x + 1)(3x - 4)$

.....

.....

Answer.....

(b) Factorise $6x^2 - 23x - 4$

.....

.....

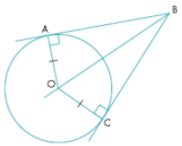
Answer .....

Year 10

AB and CB are tangents from B to the circle with centre O.
OA and OC are radii.

a Prove that angles AOB and COB are equal.

b Prove that OB bisects the angle ABC.



1) Given the f(x) = 2x – 3 and g(x) = x^2 + 5

a) Find in terms of x i) fg(x)
ii) gf(x)

b) Solve for x when fg(x) = gf(x)
Give your answer to 2 d.p.

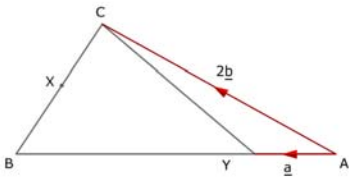
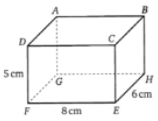
Hint: this means use the quadratic formula

5. OK now let's just get ridiculous. Make x the subject... don't bother expanding brackets unless you need to.

a) $y = \sqrt{\frac{x+1}{x+2}}$ b) $y = \sqrt[3]{\frac{x}{x+1}} - 2$ c) $y = 3 + \sqrt{\frac{2x-ax}{x}}$

d) $y = \left(\frac{x+3}{x-4}\right)^3 + 1$ e) $\frac{1}{y} = \frac{1}{x} + \frac{1}{z}$ f) $y = x^2 + 6x + 9$

2) Given the f(x) = $\frac{x}{5} - 2$
and g(x) = x^2 find gf(x)

Year 11	X is the midpoint of BC. Y lies on AB such that AY : YB = 1 : 3. $\overrightarrow{AY} = \underline{a}$ $\overrightarrow{AC} = 2\underline{b}$ Work out: $\overrightarrow{BC}$ = [2] $\overrightarrow{CY}$ = [2] $\overrightarrow{XY}$ = [2]  Can you answer part of an A level Mechanics question? b) Calculate angle BFH  Grade A* Mastery of algebra fractions - can you answer this question? Explain why this fraction cannot have the value of x as 1 or – 3 as part of the answer $\frac{3x}{x^2+2x-3}$

Reading Opportunities

There are hundreds of maths books in the Painsley library including:

- Formula one maths
- Formula one maths gold
- Using maths extreme sports
- Longman brain trainer
- Challenge your brain: maths and logic puzzles
- The mathematical funfair
- Dictionary of maths
- The 'for dummies' series
- God created the integers
- The amazing mathematical amusement arcade
- Letters to a young mathematician
- Why do buses come in threes?
- Fermat's last theorem
- The cracking code book
- How long is a piece of string?
- Secrets of a mental mathematician
- Mathematical treasure hunts
- Strategy games
- And much much more…