

Post 16 Induction - Mathematics.

Year 11 Preparing for A-level Maths: Helpful videos and resources for working from home and MyMaths tasks to complete to check understanding.

We would highly recommend purchasing / downloading the CGP booklet 'Head Start to A-Level Maths'. This is a great booklet to help support you recap and review of the key elements from GCSE to support your A Level studies in Year 12.

We've suggested specific tasks to do on a week by week basis over the summer – some to keep your skills up to scratch and some just for the love of maths! Enjoy, and don't hesitate to contact Mr Molyneux or Mrs Pearce if you have any questions. We have set the MyMaths tasks on your account for all those students we knew had opted for A Level maths next year. If they are not there and you would like to be added to this group, just drop us an email.

Remember that there is also the AS/A Level Mathematics Summer Work sheet to complete by your first maths lesson in September.

Extra support:

Underground Mathematics

This resource is FULL of lots of tasks and challenges. If you are feeling less confident with a topic then use the '*building block*'. If you want more of a challenge, then carry out one of the '*fluency exercise*'.

<https://undergroundmathematics.org/>

| | Topics to Prepare | MyMaths task to complete | Corbett Maths Videos and Resources (No subscription required) | Extending mathematical experience |
|---|--------------------------|---|---|--|
| 1 | Algebra and Proof | Identities Proof Rearranging 2 | 111 - Equations: involving fractions 112 - Equations: fractional advanced 112 - Equations: cross multiplication 365 – Algebraic proof 366 – Geometric proof | The Wizard standoff riddle. https://ed.ted.com/lessons/can-you-solve-the-wizard-standoff-riddle-daniel-finkel |
| 2 | Quadratics | Factorising quadratics 1 Quadratic equations 1 Properties of quadratics Sketching quadratic graphs | 119a - Factorisation: splitting the middle 120 - Factorisation: difference of 2 squares 10 - Algebra: completing the square 266 - Quadratics: solving (factorising) 267 - Quadratics: formula 267a - Quadratics: solving (completing the square) 265 - Quadratic graphs: sketching using key points 371 - Quadratic graphs (completing the square) | Choose one of the reading suggestions from the Summer reading list below. |

| | | | | |
|---|---------------------------------------|---|---|--|
| 3 | Algebraic fractions 1 | Cancelling algebraic fractions Adding algebraic fractions | 21 - Algebraic Fractions: addition 24 - Algebraic Fractions: Simplifying | Read the notes on the page and carry out the algebraic investigation. Complete the worksheet included. https://www.teachmathematics.net/page/7566/oxo |
| 4 | Algebraic fractions 2 | Multiply algebraic fractions Solving equations with fractions | 22 - Algebraic Fractions: division 23 - Algebraic Fractions: Multiplication 111 - Equations: involving fractions 112 - Equations: fractional advanced 112 - Equations: cross multiplication | Create a PINTREST board with images of maths in nature. Investigate the maths behind some of the images you have found. |
| 5 | Simultaneous Equations | Simultaneous equations 3 Simultaneous negative Solving simultaneous equations graphically | 295 - Simultaneous equations (elimination) 296 - Simultaneous equations (substitution, both linear) 297 - Simultaneous equations (graphical) 298 - Simultaneous equations (advanced) | Maths Magic. Can you create your own version of the problem? Investigate other magic tricks which are based around maths. https://nrich.maths.org/1051 |
| 6 | Cubics, circles and Pythagoras | Sketching cubic graphs Equations of circles Pythagoras' theorem | 344 – Types of graph: cubics 346 - Types of graph: reciprocal 12 - Algebra: equation of a circle 259 - Pythagoras: 3D | Choose one of the reading suggestions from the Summer reading list below. |

| | | | | |
|---|-------------------------------|---|---|---|
| | | | <p>260 - Pythagoras: rectangles/isosceles triangles</p> <p>263 - Pythagoras: distance points</p> | |
| 7 | Trigonometry | <p>Trig missing angles</p> <p>Trig missing sides</p> <p>Cosine rule sides</p> <p>Cosine rule angles</p> | <p>332 - Trigonometry: 3D</p> <p>338 - Trigonometry: Sine graph</p> <p>339 - Trigonometry: Cosine graph</p> <p>340 - Trigonometry: Tangent graph</p> <p>333 - Trigonometry: sine rule (sides)</p> <p>334 - Trigonometry: sine rule (angles)</p> <p>334a - Trigonometry: sine rule (ambiguous case)</p> <p>335 - Trigonometry: cosine rule (sides)</p> <p>336 - Trigonometry: cosine rule (angles)</p> | <p>Golden Ratio Day</p> <p>Golden ratio day is 1st June 2018. Investigate the golden ratio and its history.</p> <p>https://www.teachengineering.org/activities/view/nyu_phi_activity1</p> <p>https://www.quora.com/How-is-the-golden-ratio-useful-to-students</p> <p>Find more articles on this and create a poster all about the golden ratio.</p> |
| 8 | Tangents & Vectors | <p>Tangents and chords of curves</p> <p>Vectors 1</p> <p>Vectors 2</p> | <p>194 - Linear graphs: find equation of a line</p> <p>195 - Linear graphs: equation through 2 points</p> <p>196 - Linear graphs: parallel lines</p> <p>197 - Linear graphs: perpendicular lines</p> <p>372 - Equation of a Tangent to a Circle</p> <p>353 – Vectors</p> <p>354 – Vectors: Column</p> | <p>Complete module 1- Advanced Problem Solving</p> <p>https://nrich.maths.org/10209</p> |

| | | | | |
|----|----------------------------|--|--|---|
| 9 | Sequences | Arithmetic sequences Geometric sequences 1 Geometric sequences 2 | 287a – Fibonacci sequences 288 – Sequences: nth term 289 - Sequences: nth term for fractional sequences 375 – Geometric progressions | Choose one of the reading suggestions from the Summer reading list below. |
| 10 | Surds & Indices | Surds 1 Surds 2 Indices 2 Indices 3 Indices 4 | 305 - Surds: intro, rules, simplifying 307 - Surds: rationalising denominators 308 - Surds: expanding brackets 173 - Indices: fractional 174 - Indices: laws of 175 - Indices: negative | Solve the false positive riddle. https://ed.ted.com/lessons/can-you-solve-the-false-positive-riddle-alex-gendler |
| 11 | Inequalities | Inequalities worksheet (4 & 5) Inequalities worksheet (6 & 7) Inequalities worksheet (8 & 9) | 180 - Inequalities: graphical $y > a$ or $x > a$ 181 - Inequalities: graphical $y > x + a$ 182 - Inequalities: region 378 - Inequalities: quadratic | Choose one of the reading suggestions from the Summer reading list below. |

Summer Reading list

- Fermat's Last Theorem (Singh)
- Does God Play Dice and Nature's Numbers (Stewart)
- Easy as Pi (Ivanov)

- The Music of the Primes (du Sautoy)
- Just Six Numbers (Rees)
- In Code (Flannery)
- Numbers, Sets and Axioms (Hamilton)
- The Universe and the Teacup –the Maths of Truth and Beauty (K.C. Cole)
- Algebra and Geometry (Beardon)
- Hidden Connections, Double Meanings (Wells)
- Elastic Fishponds. The Maths that Governs our World (Elwes)
- The Norm Chronicles (Blastland and Spitgethaltes)
- Our Mathematical Universe (Max Tegmark)
- Updates for 2018 are Beyond Infinity (Cheng)
- Weapons of Math Destruction (O'Neill)
- Ian Stewart's 17 equations that Changed the World and Thinking in Numbers (Temmet)