National 5 Mathematics Resources

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| Unit 1 | | |
| Order of Operations | [Order of Operations](https://www.youtube.com/watch?v=5Qk4-iAOwi8)  [Order of Operations Skills Test 1](https://www.khanacademy.org/math/pre-algebra/order-of-operations/order_of_operations/e/order_of_operations_2)  [Order of Operations Skills Test 2](https://www.khanacademy.org/math/pre-algebra/order-of-operations/order_of_operations/e/order_of_operations) |  |
| Significant Figures | [rounding using significant figures](https://www.youtube.com/watch?v=MK5C1N9e3vw) |  |
| Fractions | [converting mixed numbers to improper fractions](https://www.youtube.com/watch?v=ggYdPef3Nuk)  [simplifying fractions](https://www.youtube.com/watch?v=8JrORrjqLWs)  [adding and subtracting fractions](https://www.khanacademy.org/math/pre-algebra/fractions-pre-alg/fractions-unlike-denom-pre-alg/v/adding-fractions-with-unlike-denominators)  [multiplying fractions](https://www.youtube.com/watch?v=LU3R2JE5c_U)  [dividing fractions](https://www.youtube.com/watch?v=uMTqaEbXQ6k) | 71 - 71 |
| Percentages | [non calculator strategies](http://corbettmaths.com/2012/08/20/percentages-of-amounts-non-calculator/)  [profit/loss](https://www.youtube.com/watch?v=CuQO-XeWYxw)  [compound interest](https://www.khanacademy.org/economics-finance-domain/core-finance/interest-tutorial/compound-interest-tutorial/v/introduction-to-compound-interest)  [appreciation/depreciation](https://www.youtube.com/watch?v=etya5wpEQAs)  [reversing a percentage change](https://www.youtube.com/watch?v=REr1_Lf2pZM) | 67 - 70 |
| Algebra – Expanding Brackets and Factorising | [multiplying out brackets](http://www.examsolutions.net/maths-revision/core-maths/algebra-and-functions/expanding-brackets/single/tutorial-1.php)  [multiplying out pairs of brackets](https://www.youtube.com/watch?v=iB3L5csbB4E)  [multiplying 2 terms by three terms](https://www.youtube.com/watch?v=_2NvkxBchm8)  [factorising - highest common factor](https://www.youtube.com/watch?v=iiPZLQjBHwo)  [factorising - difference of 2 squares](https://www.youtube.com/watch?v=tvnOWIoeeaU)  [factorising - trinomials](https://www.youtube.com/watch?v=nz058Hil6rA)  [completing the square](https://www.youtube.com/watch?v=ocxUbjOgfTs) | 8 - 13 |
| Algebraic Fractions | [simplifying algebraic fractions](https://www.youtube.com/watch?v=T7322sdiLWg)  [factorising to simplify algebraic fractions](https://www.youtube.com/watch?v=3Qz1Ge8sLXY)  [adding and subtracting algebraic fractions](http://www.interactive-maths.com/adding-and-subtracting-algebraic-fractions-video.html)  [multiplying and dividing algebraic fractions](https://www.youtube.com/watch?v=zTYw5Jipdy4) | 14 - 17 |
| Surds and Indices | [rules for indices and surds](https://www.youtube.com/watch?v=Ym_r5aAZ52E)  [rationalising the denominator](https://www.khanacademy.org/math/algebra/rational-exponents-and-radicals/simplifying-radical-expressions/v/how-to-rationalize-a-denominator)  [negative powers](https://www.khanacademy.org/math/pre-algebra/exponents-radicals/negative-exponents-tutorial/v/negative-exponents)  [multiplying out brackets with surds](https://www.youtube.com/watch?v=T3GeeLFqfkk) | 3 - 5 |
| Volume | [area of a rectangle, triangle, parallelogram and trapezium](https://www.youtube.com/watch?v=wIoSYSHEfkg)  [area of kites and rhombii](https://www.youtube.com/watch?v=w4V7neLSQ1o)  [volume of cubes and cuboids](https://www.youtube.com/watch?v=TxAi3J_LlzA)  [volume of composite cubes and cuboids](https://www.youtube.com/watch?v=I3vYW5SUp3Y)  [units of volume and capacity](https://www.youtube.com/watch?v=luDoyp2G-YM)  [surface area](https://www.youtube.com/watch?v=ZJ-VMcbLTaU) (up to 11 min 50 sec)  [volume of prisms and cylinders](https://www.youtube.com/watch?v=0H3_iRc-DG0)  [volume of pyramids](https://www.youtube.com/watch?v=e7-am8JtREI)  [volume of cones](https://www.youtube.com/watch?v=dtgHBVRHI1E)  [volume of spheres](https://www.youtube.com/watch?v=0G30dNbbmJc)  [curved surface area](https://www.youtube.com/watch?v=6epyKmNgLl8)  [surface area examples](https://www.youtube.com/watch?v=oZQzI8NICNE)  [composite shapes 1](https://www.youtube.com/watch?v=bolTauMy4B4)  [composite shapes 2](https://www.youtube.com/watch?v=znDQN8iJyEw)  [composite shapes 3](https://www.youtube.com/watch?v=JbdekwWuR8Q) | 21 - 23 |
| Circle Sectors | [calculating arc length](https://www.youtube.com/watch?v=vGP6gjnZcXQ)  [calculating area of a sector](https://www.youtube.com/watch?v=4HFkHP43sWA)  [mixed sector problems](https://www.youtube.com/watch?v=GcEiX3DQ0QE)  [finding the angle in a sector](https://www.youtube.com/watch?v=D9xX8ip7kRc) | 19 - 20 |
| Gradient | [introduction to gradient](https://www.youtube.com/watch?v=3P6st3xNMvM)  [gradient using coordinates](https://www.youtube.com/watch?v=dspYtArOUnQ)  [gradient of horizontal and vertical lines](https://www.youtube.com/watch?v=N5i8bFIpupg) | 17 - 18 |
| Unit 2 | | |
| The Straight Line | [plotting straight lines using m and c](https://www.youtube.com/watch?v=MehFZ_1FPAM)  [plotting straight lines from a table of values](https://www.youtube.com/watch?v=a2IMaUJfSpQ)  [finding gradient and y-intercept from graph](https://www.youtube.com/watch?v=7LJPSo4U-SM)  [re-arranging an equation to find gradient](https://www.youtube.com/watch?v=tonrg08NILk)  [modeling real life scenarios using linear equations](https://www.youtube.com/watch?v=Rs0TJda7r78)  [equations of horizontal and vertical lines](https://www.youtube.com/watch?v=7W8-YcsF0ts)  [equation of a line in the form y = mx + c](https://www.youtube.com/watch?v=Sw3BRD3_HYQ)  [equation of a line in the form y - b = m(x - a)](https://www.youtube.com/watch?v=lSGS7KsxOTk) | 25 -28 |
| Solving Equations and Inequalities | [equations and inequalities 1](https://www.youtube.com/watch?v=7wiywrKhemE)  [equations and inequalities 2](https://www.youtube.com/watch?v=srJn2ZUYB4M)  [equations and inequalities 3](https://www.youtube.com/watch?v=bz9LEpljY28)  [equations and inequalities 4](https://www.youtube.com/watch?v=Ye8qIjXvObw)  [equations with fractions](https://www.youtube.com/watch?v=DiUzSTm330U) | 29 |
| Changing the Subject of a Formula | [changing the subject of a formula](https://www.youtube.com/watch?v=RStSzBUNxBI)  [changing the subject of a formula extended problems](https://www.youtube.com/watch?v=4rBR6DUpQkQ) | 33 |
| Simultaneous Equations | [solving simultaneous equations graphically](https://www.youtube.com/watch?v=cqBwozd8nu8)  [simultaneous equations - substitution and elimination](https://www.youtube.com/watch?v=blj2FgsQbwg) | 30 - 32 |
| Pythagoras’ Theorem | [introduction to Pythagoras' Theorem](https://www.youtube.com/watch?v=uaj0XcLtN5c)  [mixed Pythagoras' Theorem problems including using surds](https://www.youtube.com/watch?v=WziqDlzHYxU)  [converse of Pythagoras' Theorem](https://www.youtube.com/watch?v=auK6zXrNVN4) | 42 - 46 |
| Angles in Circles | [angles in circles](https://www.youtube.com/watch?v=jUAHw-JIobc) | 47- 48 |
| Polygons | [angles in polygons](https://www.youtube.com/watch?v=zKJkS_WkE4I) |  |
| Quadratics | [graphing and interpreting parabolas](https://www.youtube.com/watch?v=vpTvNFXvj38)  [graphing quadratics using root and turning point](https://www.youtube.com/watch?v=MQtsRYPx3v0)  [finding the roots by factorising](https://www.youtube.com/watch?v=MQtsRYPx3v0)  [using the quadratic formula](https://www.youtube.com/watch?v=i7idZfS8t8w) | 34 - 41 |
| Trig Graphs | [intro to trig graphs](https://www.youtube.com/watch?v=zYXKxvMmHkE)  [sketching graphs of sine and cosine](https://www.youtube.com/watch?v=YTWN6rm5VBU)  [sketching graphs of trig functions from equations](https://www.youtube.com/watch?v=1uq1E8tlRtw) | 51 - 53 |
| Trig Equations | [solving trig equations](https://www.youtube.com/watch?v=YI8td5D-jfg) | 54 - 56 |
| Similarity | [similar triangles](https://www.youtube.com/watch?v=gQoNjgayoLI)  [similarity involving parallel lines](https://www.youtube.com/watch?v=R-6CAr_zEEk)  [area scale factor](https://www.youtube.com/watch?v=7zz087jWaQY)  [volume scale factor](https://www.youtube.com/watch?v=XHjCbfJw4lM) | 49 - 50 |
| Unit 3 | | |
| Trigonometry | [area of a triangle](https://www.youtube.com/watch?v=_syV6cDk7Lg)  [using the sine rule to find a side](https://www.youtube.com/watch?v=zHf7q1oUJLA)  [using the sine rule to find an angle](https://www.youtube.com/watch?v=GjJEOnwT5MA)  [the cosine rule](https://www.youtube.com/watch?v=20yldGMZ3M4)  [trigonometry with bearings](https://www.youtube.com/watch?v=QO0k_k4bbYM) | 58 - 62 |
| Vectors | [vectors explained (up to 14:30)](https://www.youtube.com/watch?v=Sp1oJSsrB94) | 63 - 66 |
| Statistics | [mean, median, mode and range](https://www.youtube.com/watch?v=81zcjULlh58)  [cumulative frequency](https://www.youtube.com/watch?v=-dbvv_4IzgQ)  [quartiles (five figure summary)](https://www.youtube.com/watch?v=K3wsOqIqA6k)  [boxplots](https://www.youtube.com/watch?v=635ErzR9Xzc)  [explanation of standard deviation](https://www.youtube.com/watch?v=MRqtXL2WX2M)  [calculating standard deviation (2:20 onwards)](https://www.youtube.com/watch?v=09kiX3p5Vek)  [pie charts](https://www.youtube.com/watch?v=UrCz6yDbhb8)  [scatter graphs](https://www.youtube.com/watch?v=Ks7Q0dG_DEM)  [stem and leaf diagrams](https://www.youtube.com/watch?v=OaJXJduRiIE)  [dotplots](https://www.youtube.com/watch?v=Bsp-FSAoN98) | 74 - 81 |