

****Subject****

****Year 12 Prep Task****

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| ****Key Info**** Understand and be able to apply knowledge learnt in GCSE in preparation for A Level |
| ****Week beginning:**** ****22.07.24**** | ****Expected completion time:**  **Due Sept 2024 – first lesson.**** |
| **Activities to be completed** | **Location of resources** | **Additional resources/support** |
| Complete the below question booklet covering 7 mathematics strands. | Bellow – Also printed for pupils. | Videos helping on all the below topics plus more can be found on: <https://www.mathsgenie.co.uk/gcse.html>And<https://www.mathsgenie.co.uk/newalevel.html> |
|  **Work to be submitted:** Bellow questions covering 7 mathematics strands. |



**Mathematics Summer Transition**

**Expanding brackets
and simplifying expressions**

1. Expand 4(3*x* − 2)
2. Expand and simplify 3(*x* + 5) − 4(2*x* + 3)
3. Expand and simplify (*x* + 3)(*x* + 2)
4. Expand and simplify (*x* − 5)(2*x* + 3)

**Surds and rationalising the denominator**

1. Simplify 
2. Simplify 
3. Simplify 
4. Rationalise 
5. Rationalise and simplify 
6. Rationalise and simplify 

**Rules of indices**

1. Evaluate 100
2. Evaluate 
3. Evaluate 
4. Evaluate 
5. Simplify 
6. Simplify 
7. Write  as a single power of x
8. Write  as a single power of x

**Factorising quadratics**

**1** Factorise

 **a** 2*x*2 + *x* –3 **b** 6*x*2 + 17*x* + 5

 **c** 2*x*2 + 7*x* + 3 **d** 9*x*2 – 15*x* + 4

 **e** 10*x*2 + 21*x* + 9 **f** 12*x*2 – 38*x* + 20

**Completing the square**

**1** Write the following quadratic expressions in the form (*x* + *p*)2 + *q*

 **a** *x*2 + 4*x* + 3 **b** *x*2 – 10*x* – 3

 **c** *x*2 – 8*x* **d** *x*2 + 6*x*

 **e** *x*2 – 2*x* + 7 **f** *x*2 + 3*x* – 2

**2** Write the following quadratic expressions in the form *p*(*x* + *q*)2 + *r*

 **a** 2*x*2 – 8*x* – 16 **b** 4*x*2 – 8*x* – 16

 **c** 3*x*2 + 12*x* – 9 **d** 2*x*2 + 6*x* – 8

**Sketching quadratic graphs**

1 Sketch each graph, labelling where the curve crosses the axes.

**a** *y* = *x*2 − *x* − 6

**b** *y* = *x*2 − 5*x* + 4

**c** *y* = *x*2 – 4

**Simultaneous equations**

**1** 3*x* + 4*y* = 7

 *x* – 4*y* = 5

**2** 2*x* + *y* = 11

 *x* – 3*y* = 9

**3** 3*x* = *y* – 1

 2*y* – 2*x* = 3

**4** *y* = 2*x* + 1

 *x*2 + *y*2 = 10

**5** y – x = 2

 x2 + xy = 3