

To all students planning to study A Level Maths.

This transition work will focus on the key topic of Algebra.

If you have any questions related to Maths A Level at Henley College please contact me at [jlag@henleycol.ac.uk](mailto:jlag@henleycol.ac.uk)



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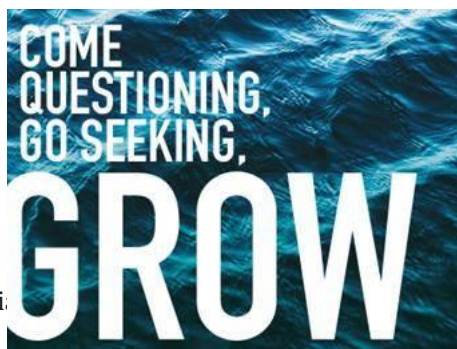
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## **A Level Mathematics**

### **Transition Activity**

**In addition to completing these questions, you may also find it useful reading through the 'Head Start to AS Maths' book for guidance ('Head Start to AS Maths' Published by CGP ISBN 9781782947929). The material included is all in the GCSE Maths Higher Syllabus. *Answers, with worked solutions, should be written by hand and brought to your first Maths lesson at the College.***

## 1. Indices:

a) What is the value of  $1^6 - 2^5 + 3^4 - 4^3 + 5^2 - 6^1$ ?

Simplify the following expressions:

b)  $\frac{4^5 \times 4^2}{4^4}$

c)  $\frac{(2^5)^2}{2^3}$

d)  $\frac{3^2 \times 3^4}{3^3 \times 3}$

e)  $x^4 \times x^{-2}$

f)  $\frac{(y^2)^4}{y^{-1} \times y^2}$

g)  $\frac{6^7}{(6^2)^6}$

h)  $5^0 \times 5^3 \times 5^4$

i)  $\frac{x^2 \times x^5}{(x^3)^2}$

Evaluate:

f)  $4^{\frac{3}{2}}$

g)  $81^{\frac{3}{4}}$

h)  $-7^{-3}$

i)  $(\frac{8}{27})^{\frac{2}{3}}$

j)  $10^0$

## 2. Rearranging Formulae

Rearrange the following to make y the subject:

a)  $x + y = 10$

b)  $4x + 2y - 6 = 0$

c)  $4x + y - 5 = 0$

d)  $3x - y - 7 = 0$

e)  $y - 6x + 9 = 0$

f)  $x - 2y = 10$

## 3. Factorise

a)  $x^2 - 36$

b)  $x^2 + 5x + 6$

c)  $x^2 - 2x - 24$

d)  $x^3 - 6x^2 + 8x$

e)  $3x^2 - 10x + 3$

f)  $2y^2 + 7y + 6$

g)  $6x^2 + 11x + 4$

h)  $4x^2 + x - 3$

i)  $3x^3 - 13x^2 + 4x$

## 4. Simultaneous equations

Solve the following pairs of simultaneous equations

a)  $\begin{cases} 3x - y = 1 \\ x + y = 3 \end{cases}$

b)  $\begin{cases} 2x + y = 7 \\ x + y = 4 \end{cases}$

c)  $\begin{cases} 2x + 3y = 9 \\ x + 4y = 7 \end{cases}$

d)  $\begin{cases} 3x + 4y = 23 \\ 2x + 5y = 20 \end{cases}$

e)  $\begin{cases} x^2 + 2y = 12 \\ y = 3x - 2 \end{cases}$

f)  $\begin{cases} x^2 + 3xy + y^2 = 11 \\ x + y = 3 \end{cases}$

## 5. Equations

Solve the following equations

$$\begin{array}{lll} \text{a)} \ 5(x + 2) = 2x + 22 & \text{b)} \ 2(x - 4) = 3x + 1 & \text{c)} \ x^2 + 8x + 15 = 0 \\ \text{d)} \ d^2 - 9d + 20 = 0 & \text{e)} \ x^2 - 16 = 0 & \text{f)} \ x^2 + 3x - 5 = 0 \end{array}$$

## 6. More Rearranging Formulae

Rearrange the following to make x the subject:

$$\begin{array}{ll} \text{a)} \ y = \frac{x}{5} + 17 & \text{b)} \ a = b - cx \\ \text{c)} \ z = \sqrt{\frac{x}{x+y}} & \text{d)} \ d = \frac{2(S-xn)}{n(n-1)} \end{array}$$

## 7. More Equations

Solve the following equations

$$\text{a)} \ \frac{4}{7}y - \frac{3}{5}y = 2 \quad \text{b)} \ \frac{m}{2} + \frac{m}{3} + 3 = 2 + \frac{m}{6} \quad \text{c)} \ \frac{x+3}{4} - \frac{x-3}{5} = 2$$

## 8. Further Equations

Solve this using the quadratic formula

$$\text{a)} \ 4x^2 + 7x - 5 = 0$$

Solve this using completing the square method and keep your answer in exact form

$$\text{b)} \ x^2 - 5x + 2 = 0$$

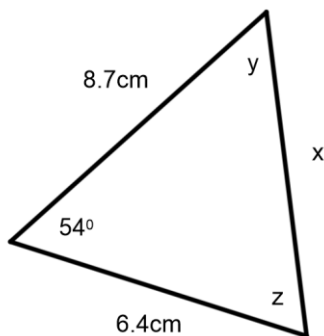
## 9. Surds

Evaluate the following:

a)  $\sqrt{4} \times \sqrt{25}$    b)  $\sqrt{7} \times \sqrt{7}$    c)  $\sqrt{2} \times \sqrt{18}$    d)  $\sqrt{6} \times \sqrt{10} \times \sqrt{15}$

## 10. Trigonometry

a) Calculate all missing angles and lengths in this triangle



b) Calculate the area of the triangle above

## 11. Miscellaneous

a) How many 2-digit numbers can be formed using the digits 1, 3, 5, 7 and 8 which are divisible by 3?

b) The number 114 is the sum of 4 consecutive positive integers. What are they?

c)  $p$  and  $q$  are two positive integers.  $p^2 + q^2 = 170$ . What are the values of  $p$  and  $q$ ?

d) List the constant acceleration equations