Preparation for AS Mathematics

Welcome to the AS Mathematics course at Robert Clack School. I am sure that you are enthusiastic about the course and that you are eager to get started!

*Many of you may find that you have forgotten some of the skills that you learned at GCSE, so this piece of **compulsory** work is designed to refresh your memory of some of the higher level topics that are essential knowledge if you are to be successful at AS level mathematics.*

- ✓ This summer work is compulsory. **Your maths teacher will ask to see your work in your first maths lesson**.
- ✓ You must show all the appropriate working out.
- ✓ You must present your work clearly and staple any additional sheets.

If you are struggling to complete the questions...
Visit the "MyMaths" website. The school's login is **clack** and the current password is **circle**.

Good luck
Mrs Ahmad

Name: .....

1) STRAIGHT LINE GRAPHS

a) Find the gradient of the line passing through (2,12) and (4,1)

b) Find the equation of the line which passes through (0,-2) and has gradient 4

c) Find the distance between the points P(2,6) and Q(5,14)

d) Find the equation of the perpendicular to y = 3x+1 at the point (0,1)

2) EQUATIONS

Solve the following equations, showing each step in your working:

a) $\frac{1}{2}(x+3)=5$

b) $\frac{2x}{3}-1=\frac{x}{3}+4$

c) $\frac{y}{4}+3=5-\frac{y}{3}$

d) $\frac{x-2}{7}=2+\frac{3-x}{14}$

3) SIMULTANEOUS EQUATIONS

Solve the pairs of simultaneous equations in the following questions:

a) $x + 2y = 7$
$3x + 2y = 9$

b) $x^2 + y^2 = 13$
$5y + x = 13$

4) FACTORISING QUADRATICS

Factorise

1) $x^2 - 9$

2) $9x^2 - 25$

3) $2x^2 - 3x$

4) $3x^2 + 5x - 2$

5) $2y^2 + 17y + 21$

5) CHANGING THE SUBJECT OF A FORMULA

Make *t* the subject of each of the following

a) $P = \frac{wt}{32r}$

b) $p = \sqrt{\frac{t+1}{u}}$

Make *x* the subject of these formulae:

c) $ax + 3 = bx + c$

d) $3(x + a) = k(x - 2)$

6) SOLVING QUADRATIC EQUATIONS

Use factorisation to solve the following equations:

a) $x^2 + 3x + 2 = 0$

b) $x^2 - 3x - 4 = 0$

Use the formula to solve the following equations to 3 significant figures.

a) $x^2 + 7x + 9 = 0$

b) $6 + 3x = 8x^2$

7) INDICES

Simplify the following:

a) $3c^2 \times 2c^5 =$

b) $b^2c \times bc^3 =$

c) $2n^6 \times (-6n^2) =$

d) $d^{11} \div d^9 =$

e) $\left(-d^4\right)^3 =$

More complex powers

Find the value of:

a) $27^{1/3}$

b) $\left(1/9\right)^{1/2}$

c) 18^0

d) $\left(\frac{2}{3}\right)^{-2}$

e) $\left(\frac{8}{27}\right)^{2/3}$