**3A Linear Simultaneous Equations**

1. Solve the following Simultaneous Equations by Elimination

 $2x+3y=8$

$$3x-y=23$$

1. Solve the following Simultaneous Equations by Substitution

 $2x-y=1$

$$4x+2y=-30$$

**3B Non-Linear Simultaneous Equations**

1. Solve the following Simultaneous Equations

$$x+2y=3$$

$$x^{2}+3xy=10$$

**3C Simultaneous Equations Graphically (With the Discriminant)**

1. Draw the graphs of the following equations and use it to write down their solution:

 $2x+3y=10$

$$x$$

$$y$$

$$3x-y=4$$

1. Draw the graphs of the following equations and use it to write down their solution:

 $2x+y=3$

$$x$$

$$y$$

$$y=x^{2}-3x+1$$

Notes on the discriminant:







1. The line with equation $y=2x+1$ meets the curve with equation

$$kx^{2}+2y+\left(k-2\right)=0$$

at exactly one point. Given that $k$ is a positive constant:

1. Find the value of $k$
2. For this value of $k$, find the coordinates of the point of intersection

**3D Linear Inequalities**

1. Find the set of values of x for which:
2. $2x-5<7$
3. $5x+9\geq x+20$
4. $12-3x<27$
5. $3\left(x-5\right)>5-2(x-8)$
6. Find the set of values of x for which:
7. $3x-5<x+8$ and $5x>x-8$
8. $x-5>1-x$ and $15-3x>5+2x$
9. $4x+7>3$ and $17<11+2x$

**3E Quadratic Inequalities**

1. $x^{2}-4x-5<0$
2. $3-5x-2x^{2}<0$
3. Find the values of k for which the equation:

$$\left(k+3\right)x^{2}+6x+k-5=0$$

has two real roots.

1. Find the set of values for which:

$$\frac{6}{x}>2$$

**3F Interpreting Graphical Non-Linear Inequalities**

1. $L\_{1}$has equation$y=12+4x$

$L\_{2}$ has equation $y=x^{2}$

The diagram below shows a sketch of $L\_{1}$ and $L\_{2}$ on the same axes.



1. Find the coordinates of the points of intersection
2. Hence write down the solution to the inequality $12+4x>x^{2}$

**3G Shading Inequality Regions**

1. On graph paper, show the region that satisfies the following inequalities:

$$y\geq -2$$

$$x<5$$

$$y\leq 3x+2$$

$$x>0$$

$$x$$

$$y$$

1. On graph paper, show the region that satisfies the following inequalities:

$$x$$

$$y$$

$$2y+x<14$$

$$y>x^{2}-3x-4$$