Y12 COORDINATE GEOMETRY: ESSENTIALS FOR ACHIEVEMENT.

## Very Basic.

1. A is $(4,3) \mathrm{B}$ is $(8,5)$
(a) Find the distance $A B$ and round answer to 3sigfig (DRAW A PICTURE AND USE PYTHAGORAS' THEOREM.)

Length $^{2}=4^{2}+2^{2}$
Length $=4.47$

(b) Find the coordinates of the mid point of AB
$=\left(\frac{4+8}{2}, \frac{3+5}{2}\right)$
$=(6,4)$
(c) Find the gradient of AB

$$
=1 / 2
$$

(d) Find the equation of AB USE $\mathrm{y}=\mathrm{mx}+\mathrm{c}$
AND SUBSTITUTE $\mathrm{m}=1 / 2$
and $\mathrm{x}=4$ and $\mathrm{y}=3$ in order to find c .
$\mathrm{y}=\mathrm{mx}+\mathrm{c}$
$3=1 / 24+c \quad$ so $c=1$
Line is $y=1 / 2 x+1$
(e) Find the intersection
point of these line graphs
using your graphics
calculator:

$$
\begin{array}{r}
3 \mathrm{x}+2 \mathrm{y}=34 \\
13 \mathrm{x}+9 \mathrm{y}=149 \\
\mathbf{x}=\mathbf{8} \quad \mathrm{y}=\mathbf{5}
\end{array}
$$

## Basic.

2. C is $(1,5) \mathrm{D}$ is $(3,-1)$
(a) Find length CD to 3 s.f.


Length ${ }^{2}=2^{2}+6^{2}$
Length $=6.32$
(b) Find the mid point of
$\underset{\operatorname{Mid} \mathbf{P t}}{\mathrm{CD}}=\left(\frac{1+3}{2}, \frac{5-1}{2}\right)$

$$
=(2,2)
$$

(c) Find the gradient of CD remember

gradient $=-3$
(d) Find the equation of CD

$$
y=m x+c
$$

$$
5=-3.1+c
$$

$$
8=c
$$

Line is $\mathrm{y}=-3 \mathrm{x}+8$
(e) Find the intersection point of the lines:

$$
\begin{gathered}
2 x+4 y=15 \\
5 x-12 y=21 \\
x=6 \quad y=.75 \text { or } 3 / 4
\end{gathered}
$$

## Normal Achieved.

3. On a map, two islands are situated at $\mathrm{E}(8,69)$ and $\mathrm{F}(12,81)$.
The units are in 100s of Km
(a) Find the distance in hundreds of Kms between the islands rounded to 3 s.f.

Dist ${ }^{2}=4^{2}+12^{2}$
Dist $=12.6$ hundred Km

(b) A volcanic island is midway between them. Find its coordinates.

$$
M=\left(\frac{8+12}{2}, \frac{69+81}{2}\right)
$$

$$
=(10,75)
$$

(c) Find the gradient of EF.

$$
\mathrm{m}=3
$$

(d) Find the equation of the line joining $E$ and $F$.
$y=m x+c$
$69=3.8+c$
$\mathrm{c}=45$
equ is $\mathrm{y}=3 \mathrm{x}+45$
(e) Another island is at the intersection of:
$5 x+3 y=55$
$2 x-9 y=5$
Find its position.

$$
x=10, \quad y=1.67
$$

