Who, where and when?

One of the following four people has committed a crime. The criminal made 2 errors, the victim has made 0 errors and the other two suspects have made 1 error.

$\mathbf{a} = \begin{pmatrix} 3 \\ 5 \end{pmatrix}$ $\mathbf{b} = \begin{pmatrix} 8 \\ -4 \end{pmatrix}$ $\mathbf{c} = \begin{pmatrix} 2 \\ 6 \end{pmatrix}$ $\mathbf{d} = \begin{pmatrix} -3 \\ -6 \end{pmatrix}$ $\mathbf{e} = \begin{pmatrix} 9 \\ 15 \end{pmatrix}$

Victor said:

$\mathbf{a} + \mathbf{b} = \begin{pmatrix} 11 \\ 1 \end{pmatrix}$

$\mathbf{c} + \mathbf{d} = \begin{pmatrix} -1 \\ 0 \end{pmatrix}$

$\mathbf{e} = 3\mathbf{a}$

$\mathbf{a} + 2\mathbf{b} = \begin{pmatrix} 19 \\ 3 \end{pmatrix}$

The girls said:

$\mathbf{a} + \mathbf{c} = \begin{pmatrix} 5 \\ 11 \end{pmatrix}$

$\mathbf{a} + \mathbf{d} = \begin{pmatrix} 6 \\ 11 \end{pmatrix}$

$5\mathbf{d} = \begin{pmatrix} -15 \\ -30 \end{pmatrix}$

$2\mathbf{c} + \mathbf{a} = \begin{pmatrix} 7 \\ 17 \end{pmatrix}$

The minions said:

$\mathbf{d} + \mathbf{e} = \begin{pmatrix} 6 \\ 9 \end{pmatrix}$

$\mathbf{a} + \mathbf{b} = \begin{pmatrix} 11 \\ 9 \end{pmatrix}$

$\mathbf{a} + 2\mathbf{b} = \begin{pmatrix} 19 \\ -3 \end{pmatrix}$

$2\mathbf{d} + \mathbf{c} = \begin{pmatrix} -4 \\ 6 \end{pmatrix}$

Gru said:

$\mathbf{a} + \mathbf{e} = \begin{pmatrix} 12 \\ 20 \end{pmatrix}$

$\mathbf{d} + \mathbf{b} = \begin{pmatrix} 5 \\ -10 \end{pmatrix}$

$2\mathbf{e} = \begin{pmatrix} 18 \\ 30 \end{pmatrix}$

$\frac{1}{2}\,\mathbf{c} = \begin{pmatrix} 1 \\ 3 \end{pmatrix}$

Now you need to work out where and when the crime was committed....

Where and when?

Use the questions on the accompanying sheet

The murder was committed at one of the locations below, but which one?
It happened where **the most mistakes have been made.**

Gru's Lab on Monday	Q1. **AB = b – a** Q2. **AP** = $\frac{1}{3}$ **b** - $\frac{1}{3}$ **a** Q3. **AF** = $\frac{1}{3}$ **(c – a)** Q4. **FA = - b**
Vector's house on Wednesday	Q1. **BA = a – b** Q2. **PB** = $\frac{2}{3}$ **(b – a)** Q3. **OF**= $\frac{2}{3}$ **a** +$\frac{1}{3}$ **c** Q4. **EB** = 2**b**
Miss Hattie's Home for Girls on Saturday	Q1. **CD** = 2**b** – 2**a** Q2. **BA = b - a** Q3. **OE = c** + 2**a** Q4. **AC = b – 2a**
Bank of Evil on Thursday	Q1. **OC** = 2**a** Q2. **AB = a + b** Q3. **AC = c - a** Q4. **BD = a + b**

The Accusation	
Who	
Where & When	