

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:

$$a + b = {11 \choose 1}$$

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

$$e = 3a$$

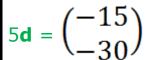
$$\mathbf{a} + 2\mathbf{b} = \binom{19}{3}$$



The girls said:

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

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



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

The minions said:

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

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

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

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



Gru said:

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

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

$$2e = \binom{18}{30}$$

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



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

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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. $CD = 2b - 2a$
	Q2. $BA = b - a$
	Q3. OE = $c + 2a$
	Q4. $AC = b - 2a$
Bank of Evil on Thursday	Q1. $OC = 2a$
	Q2. $AB = a + b$
	Q3. $AC = c - a$
	Q4. $BD = a + b$

The Accusation	
Who	
Where & When	

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