

CRIME SCENE INVESTIGATION

A crime has been committed by one of the ten suspects below.

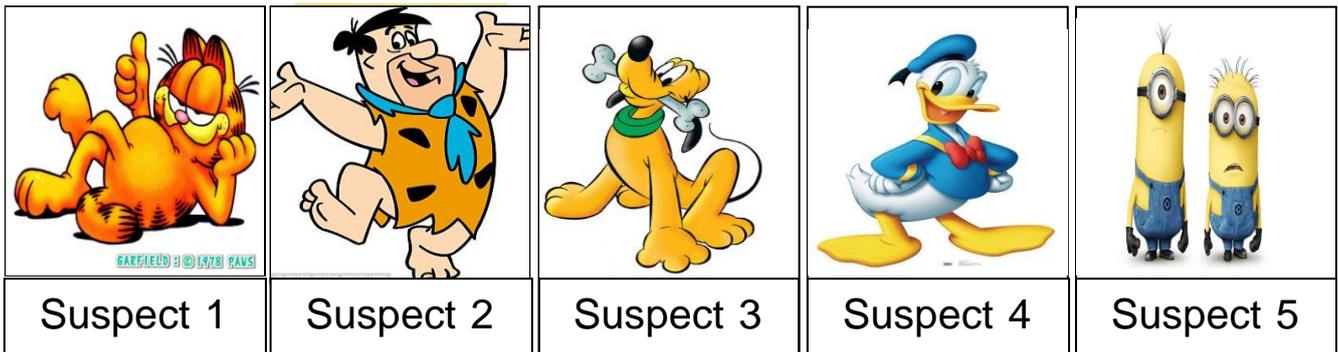
You have been brought in as a police consultant.

You should analyse the evidence provided to eliminate
nine of the suspects.

You will need to be ready to present your findings to the chief
inspector in 50 minutes.

Good Luck!

THE SUSPECTS:



EVIDENCE 1: BLOOD TYPE

The suspect caught their arm on some glass and so you were able to get a sample of their blood, it has been confirmed as Type A. Blood analysis works by looking for antibodies which indicate the blood type.

X antibodies indicate Type A, Y antibodies indicate Type B and Z antibodies indicate Type O.

You need to analyse the lab results to see which antibodies the blood contains, anyone who isn't type A can be eliminated.

Suspect 1: $3x + 2y - 3x$

Suspect 2: $4x - 4x + 7y - 3y + x$

Suspect 3: $4y + 2y + x + 2x$

Suspect 4: $3y - 3y + 4x$

Suspect 5: $7x + 3x - 6x$

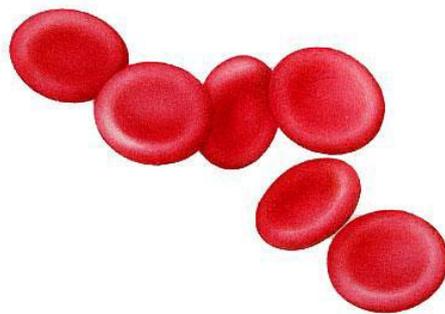
Suspect 6: $2x + 2y - 2x$

Suspect 7: $3x + y - 3y$

Suspect 8: $2y + 2z + z + x$

Suspect 9: $-8x - 2x$

Suspect 10: $2x + y - 2z - 2x$



Show working behind and fill the table on the last page.

WORKING SIDE

Who is eliminated and why? Justify your verdict. How can this simplify your next task?

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EVIDENCE 2: KEY CODE

The money was stolen from a safe which has a key code. Each suspect was questioned using a lie detector. The final digit of the code is 6, work out their answers and eliminate any suspects who did not know $x = 6$.

Suspect 1: $x + 9 = 15$

Suspect 2: $x - 5 = 1$

Suspect 3: $x + 3 - 9 = 0$

Suspect 4: $2x + 4 = 18$

Suspect 5: $3x - 1 = 17$

Suspect 6: $4x + 10 = 34$

Suspect 7: $5x - 6 = 24$

Suspect 8: $2x / 6 = 2$

Suspect 9: $3(2x + 1) = 38$

Suspect 10: $7x = 42$



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WORKING SIDE

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EVIDENCE 3: FINDING VAUES

More than £12 million was stolen in this crime. Eliminate any suspects who have £12 million or less after substituting the value of each if **a=2, x=5 and y=-1**

Suspect 1: $y x y x a x a$

Suspect 2: x^2y^4

Suspect 3: a^4

Suspect 4: $3y^2$

Suspect 5: $3x - 3y^2$

Suspect 6: $4x^2$

Suspect 7: $2 x 3ay^2$

Suspect 8: $8 x 7 x a x y x y$

Suspect 9: $a x a x a x y$

Suspect 10: $8a^2$



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WORKING SIDE

Who is eliminated and why? Justify your verdict. How can this simplify your next task?

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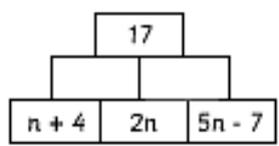
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EVIDENCE 4: CLIMB THE PYRAMID

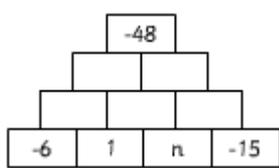
In order to break through the door the criminal must eliminate the suspect if the **coefficient of x is a multiple of 5**.

1



Change n to x

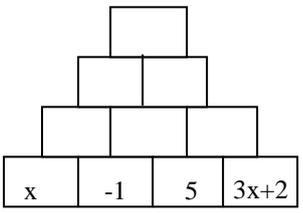
2



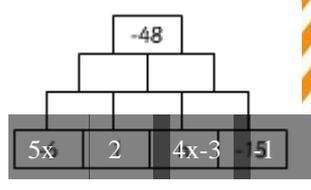
Change n to x and del -48

3

4

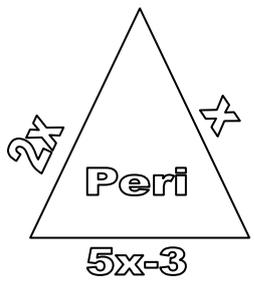


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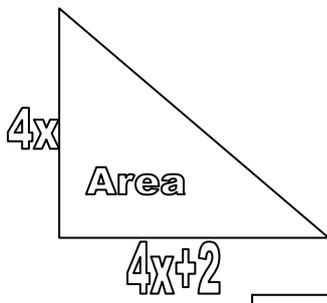


Delete -48

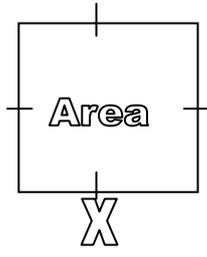
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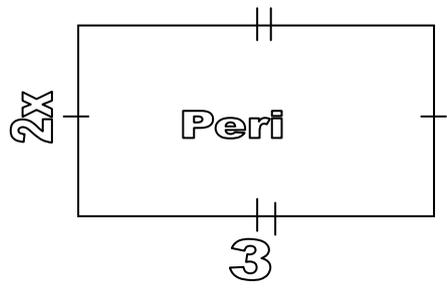
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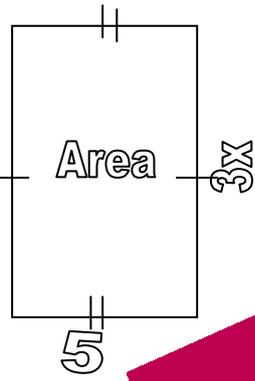
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The power of "At least..."
 thehottmom.com

Show working behind and fill the table on the last page.

WORKING SIDE

Who is eliminated and why? Justify your verdict. How can this simplify your next task?

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EVIDENCE 5: DIGITAL SIGNATURE

The CCTV cameras were hacked during the crime and turned off. The police were able to trace the digital signature of the computer which they worked out to be $12x + 32y$. Each of the suspects laptops were confiscated by police and their signatures were checked. The results are below.

Suspect 1: $6(2x + 4y)$

Suspect 2: $4(3x + 4y)$

Suspect 3: $6(3x + 4y)$

Suspect 4: $4(2x + 8y)$

Suspect 5: $4(3x + 9y)$

Suspect 6: $8(2x + 4y)$

Suspect 7: $3(4x + 10y)$

Suspect 8: $2(6x + 16y)$

Suspect 9: $12(x + 3y)$

Suspect 10: $2(6x + 19y)$



WORKING SIDE

Who is eliminated and why? Justify your verdict. How can this simplify your next task?

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	A	C	D
1-2	The student is able to: i. select appropriate mathematics when solving simple problems in familiar situations ii. apply the selected mathematics successfully when solving these problems iii. generally solve these problems correctly.	The student is able to: i. use limited mathematical language ii. use limited forms of mathematical representation to present information iii. communicate through lines of reasoning that are difficult to interpret.	The student is able to: i. identify some of the elements of the authentic real-life situation ii. apply mathematical strategies to find a solution to the authentic real-life situation, with limited success.
3-4	The student is able to: i. select appropriate mathematics when solving more complex problems in familiar situations ii. apply the selected mathematics successfully when solving these problems iii. generally solve these problems correctly.	The student is able to: i. use some appropriate mathematical language ii. use different forms of mathematical representation to present information adequately iii. communicate through lines of reasoning that are able to be understood, although these are not always clear iv. adequately organize information using a logical structure.	The student is able to: i. identify the relevant elements of the authentic real-life situation ii. select , with some success, adequate mathematical strategies to model the authentic real-life situation iii. apply mathematical strategies to reach a solution to the authentic real-life situation iv. describe whether the solution makes sense in the context of the authentic real-life situation
5-6	The student is able to: i. select appropriate mathematics when solving challenging problems in familiar situations ii. apply the selected mathematics successfully when solving these problems iii. generally solve these problems correctly.	The student is able to: i. usually use appropriate mathematical language ii. usually use different forms of mathematical representation to present information correctly iii. move between different forms of mathematical representation with some success iv. communicate through lines of reasoning that are clear although not always coherent or complete v. present work that is usually organized using a logical structure.	The student is able to: i. identify the relevant elements of the authentic real-life situation ii. select adequate mathematical strategies to model the authentic real-life situation iii. apply the selected mathematical strategies to reach a valid solution to the authentic real-life situation iv. describe the degree of accuracy of the solution v. discuss whether the solution makes sense in the context of the authentic real-life situation.
7-8	The student is able to: i. select appropriate mathematics when solving challenging problems in both familiar and unfamiliar situations ii. apply the selected mathematics successfully when solving these problems iii. generally solve these problems correctly.	The student is able to: i. consistently use appropriate mathematical language ii. use different forms of mathematical representation to consistently present information correctly iii. move effectively between different forms of mathematical representation iv. communicate through lines of reasoning that are complete and coherent v. present work that is consistently organized using a logical structure.	The student is able to: i. identify the relevant elements of the authentic real-life situation ii. select appropriate mathematical strategies to model the authentic real-life situation iii. apply the selected mathematical strategies to reach a correct solution iv. explain the degree of accuracy of the solution v. explain whether the solution makes sense in the context of the authentic real-life situation.
TASK SPECIFIC	To reach the highest level in this criterion you must get all the answers correctly, use the knowledge gained in class re algebra.	To reach the highest level in this criterion you must show all the working for all evidences and try and use different forms of representation wherever possible.	To reach the highest level you must justify all evidences in detail and explain why are you eliminating or not eliminating the suspects. Also, you must answer the question that how will 1 evidence help the next task.

