

# Who, where and when?

## Who?

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.

**Q1.**       $y = 3x + 3$                       (1)  
               $y = 2x - 7$                       (2)

**Q2.**       $x^2 + y = 6$                       (1)  
               $y = x$                                 (2)

**Q3.**       $x^2 - 2y = 2$                       (1)  
               $y = x + 3$                       (2)

**Q4.**       $x^2 + 4y = 7$                       (1)  
               $2y = 2 - x$                       (2)

**Q5.**       $y = 3x^2 - 2$                       (1)  
               $y = 3 - 2x$                       (2)

**Q6.**       $2y = 4x^2 - 7$                       (1)  
               $y = 6x$                                 (2)

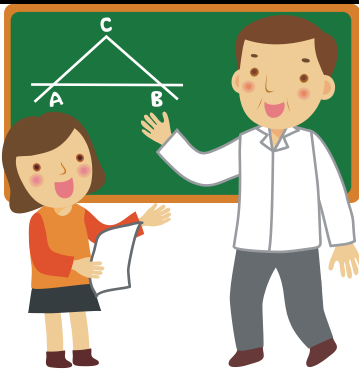
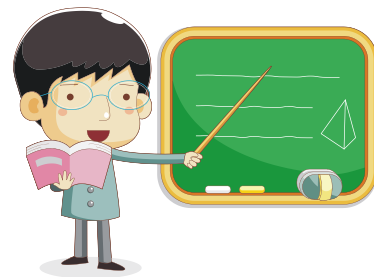
The ICT teacher said:

- Q1 are both linear equations
- Q2 has two solutions for  $y$
- Q3 factorises into
$$(x - 4)(x + 2) = 0$$
- Q1  $y = -27$



The history teacher said:

- Q2 has one linear equation & one quadratic
- Q1 has two solutions for  $x$
- Q3 solutions are  $(4, 7)$  and  $(-2, 1)$
- Q1  $x = -10$



The maths teacher said:

- Q4 has one linear equation & one quadratic
- Q1 solution is  $(-10, -27)$
- Q6 factorises into
$$(2x - 7)(2x + 1) = 0$$
- Q4 solutions are  $(1, 0.5)$  and  $(-1, 1.5)$

The PE teacher said:

- Q6 are both linear
- Q5 factorises into
$$(3x + 5)(x - 1) = 0$$
- Q2 solutions are  $(3, 3)$  and  $(-2, -2)$
- Q5 solutions are  $(1, 1/3)$  and  $(1, 1)$



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

## Where & When?

The murder was committed at one of the locations below, but which one?  
It happened where **ALL** the statements are correct.

**Q1.**       $x^2 + y^2 = 16$                       (1)  
 $y = x - 1$                                       (2)  
    (answer to 2 dp)

**Q2.**       $y = 3 - x^2$                               (1)  
 $y = 5 - 3x$                                       (2)

**Q3.**       $x^2 + y^2 = 20$                       (1)  
 $y = x + 4$                                       (2)  
    (answer to 2 dp)

**Q4.**       $x^2 + y^2 = 32$                       (1)  
 $y = 1 + 3x$                                       (2)  
    (answer to 2 dp)

**Q5.**       $x^2 + y^2 = 100$                       (1)  
 $y = 2x - 3$                                       (2)  
    (answer to 2 dp)

**Q6.**       $x^2 + y^2 = 34$                       (1)  
 $y = 1 + 2x$                                       (2)  
    (answer to 2 dp)

## Where & When?

The murder was committed at one of the locations below, but which one? It happened where **ALL** the statements are correct.

|   |  |
|---|--|
| <p><b>The maths classroom on Monday</b></p> | <ul style="list-style-type: none"><li>• Only Q2 does not include an equation of a circle</li><li>• Q1 rearranges into <math>2x^2 - 2x - 15 = 0</math></li><li>• One of the solutions to Q6 is (1,3)</li><li>• The solutions to Q2 are (-1, -2) and (-2, 1)</li></ul>                             |
| <p><b>The dining hall on Wednesday</b></p>  | <ul style="list-style-type: none"><li>• Q2 is the only question you don't need to use the quadratic formula</li><li>• Q3 rearranges into <math>2x^2 + 8x - 4 = 0</math></li><li>• Q2 rearranges into <math>2x^2 + 3x + 2 = 0</math></li><li>• The solutions to Q2 are (1,2) and (2,-1)</li></ul> |
| <p><b>The gym on Thursday</b></p>           | <ul style="list-style-type: none"><li>• The solutions to Q1 are (3.28, 2.28) and (-2.28, -3.28)</li><li>• Q4 rearranges into <math>10x^2 + 6x - 31 = 0</math></li><li>• Q2 is the only one that includes a linear equation</li><li>• The solutions to Q3 are</li></ul>                           |
| <p><b>The playing fields on Friday</b></p>  | <ul style="list-style-type: none"><li>• Q5 rearranges into <math>5x^2 - 12x - 91 = 0</math></li><li>• The solutions to Q6 are (2.2, 5.4) and (-3,-5)</li><li>• Q6 rearranges into <math>5x^2 + 4x - 33 = 0</math></li><li>• The solutions to Q5 are (5.63, 8.27) and (-3.23, -9.47)</li></ul>    |