Simultaneous Equations: One Linear, One Quadratic (Grade 11)

MEMORANDUM

Name: ..... Class: .....

Date: .....

MARK ____ / 25

Answer all questions. Show all your working — marks are awarded for method as well as the final answer. **Teacher copy: accept any correct equivalent method.**

1 Solve simultaneously: $y = x + 1$ and $y = x^2 - 3x + 4$ **(4)**

$x^2 - 4x + 3 = 0 \rightarrow x = 1$ or $3 \rightarrow$ **(1 ; 2) and (3 ; 4)** ✓✓✓✓ (4)

2 Solve simultaneously: $y = 2x$ and $y = x^2 - 3$ **(4)**

$x^2 - 2x - 3 = 0 \rightarrow (x - 3)(x + 1) = 0 \rightarrow$ **(3 ; 6) and (−1 ; −2)** ✓✓✓✓ (4)

3 Solve simultaneously: $x + y = 5$ and $x^2 + y^2 = 17$ **(4)**

(1 ; 4) and (4 ; 1) ✓✓✓✓ (4)

4 Solve simultaneously: $y - x = 2$ and $xy = 8$ **(4)**

$x(x + 2) = 8 \rightarrow x^2 + 2x - 8 = 0 \rightarrow (x + 4)(x - 2) = 0 \rightarrow$ **(2 ; 4) and (−4 ; −2)** ✓✓✓✓ (4)

5 Which equation should you rearrange first, and why? **(2)**

The **linear** one — making a variable the subject of a linear equation is simple and never introduces a square root. ✓✓ (2)

6 Solve simultaneously: $y = x - 1$ and $y = x^2 - 5x + 7$ **(4)**

$x^2 - 6x + 8 = 0 \rightarrow (x - 2)(x - 4) = 0 \rightarrow$ **(2 ; 1) and (4 ; 3)** ✓✓✓✓ (4)

7 The solutions of a simultaneous system are the ... of the two graphs. **(1)**

points of intersection ✓ (1)

8 What does it mean if the resulting quadratic has a negative discriminant? **(2)**

There are **no real solutions**, so the two graphs do not intersect. ✓✓ (2)

TOTAL: 25 marks

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