

## Revision F5 (Topics 20-23) [41] MARKSCHEME

1.

|                                 |    |
|---------------------------------|----|
| Numerator = $(x + 4)(x - 4)$    | B1 |
| Denominator = $(3x - 2)(x - 4)$ | M1 |
| $= (3x - 2)(x + 4)$             | A1 |
| <i>or</i> $3x^2 + 12x - 2x - 8$ |    |
| <i>or</i> $3x^2 - 2x + 12x - 8$ |    |

|                             |    |
|-----------------------------|----|
| Answer = $(x - 4)/(3x - 2)$ | A1 |
|-----------------------------|----|

[4]

2.

|   |           |        |
|---|-----------|--------|
| (a) $180 - (90 + 25)$                             | <i>oe</i> | M1     |
| $65$  |           | A1     |
| (b) Implies or states that $C = 56$ or $BXA = 80$ |           | M1     |
| $180 - (80 + 56)$ or implies or states $A = 44$   |           | M1 dep |
| $44$  |           | A1     |
| <i>SCI 44 with no working shown</i>               |           |        |

[5]

3.

|   |                                   |       |
|---|-----------------------------------|-------|
| (a) $12 - y = 3 \times 5$                               | <i>M1 for cross multiplying 3</i> | M1    |
| $12 - 15 = y$   | <i>A1 collecting terms</i>        | A1    |
| $y = -3$  | <i>A1 cao</i>                     | A1    |
| (b) $6(2x + 1) + 4(4x + 1) = 24$                        |                                   | M1 A1 |
| <i>M1 for multiplying by 24 or 12</i>                   |                                   |       |
| <i>(allow one error)</i>                                |                                   |       |
| <i>A1 correct multiplying</i>                           |                                   |       |
| $28x + 10 = 24$   |                                   | M1    |
| <i>M1 for collecting terms to get single x term.</i>    |                                   |       |
| $x = 0.5$   |                                   | A1 ft |
| <i>A1 ft their collected terms if both M's awarded.</i> |                                   |       |

[7]

4.

|   |   |   |
|---|---|---|
| <p>e.g.<br/>         When <math>x = 0.1</math><br/> <math>(2x)^2 = 0.04</math><br/> <math>2x = 0.2</math><br/>         So <math>(2x)^2 &lt; 2x</math> which contradicts Bethany's statement<br/>         So it is not always true</p> | <p><b>3</b><br/>         2 A02.4a<br/>         1 A02.5a</p> | <p><b>M1</b> for attempting to demonstrate that for some value of <math>x</math> in range <math>0 &lt; x &lt; \frac{1}{2}</math> it is not true<br/> <b>A1</b> for complete working<br/> <b>A1</b> for explanation</p> <p>or</p> <p><b>M1</b> for attempt including squaring bracket<br/> <b>A1</b> for complete solution for either <math>x &lt; 0</math> or <math>x \geq \frac{1}{2}</math><br/> <b>A1</b> for explanation</p> <p>or</p> <p><b>B1</b> for a counter example given without working</p> |
|---|---|---|

5.

|  |                      |   |
|--|----------------------|---|
| $x = \frac{- -5 \pm \sqrt{(-5)^2 - 4 \times 1 \times 3}}{2} = \frac{5 \pm \sqrt{13}}{2}$ | <p>4.30 or 0.697</p> | <p>M1 Substitute into quadratic formula - allow sign errors<br/>         M1 Evaluate as far as <math>\frac{5 \pm \sqrt{13}}{2}</math><br/>         A1</p> |
|--|----------------------|---|

6.

- (a)  $(a =) 3$  B1  
 $(b =) -12$  B1

*Allow 12 if -12 given in working*

- (b)  $(x + 3)^2 = 12$   
 or  $(x =) \frac{-6 \pm \sqrt{6^2 - 4(1)(-3)}}{2}$  M1

*Using their values from (a)  
 Substitution into formula (allow 1 error)*

- $x + 3 = \sqrt{12}$   
 or  $(x =) \frac{-6 \pm \sqrt{36 + 12}}{2}$  M1 dep

*Using their values from (a)*

- $(x =)$   
 $\pm \sqrt{12} - 3$   
 or  $\frac{-6 \pm \sqrt{48}}{2}$  A1

7.

|                            |    |   |
|----------------------------|----|---|
| $x=0, y=5$<br>$x=-4, y=-3$ | M1 | Initial process of substitution eg $x^2 + (2x + 5)^2 = 25$  |
|                            | M1 | for expanding and simplifying eg $x^2 + 4x^2 + 10x + 10x + 25 = 25$   |
|                            | M1 | Use of factorisation or correct substitution into quadratic formula or completing the square to solve an equation of the form $ax^2 + bx + c = 0, a \neq 0$ |
|                            | A1 | correct values of $x$ or $y$  |
|                            | CI | $x = 0, x = -4, y = 5, y = -3$ correctly matched $x$ and $y$ values   |

8.

$24^\circ$  seen B1

$35^2 + 42^2 - 2 \times 35 \times 42 \times \cos 24^\circ$  M1  
 $303 (.17\dots)$

$\sqrt{\text{their } 303}$  M1 dep

17.4 A1

[4]

9.

$2(2y - 3) + 3(y + 1) [= 7y - 3]$  M1  
*Allow invisible brackets if recovered later*

$(y + 1)(2y - 3)$  M1  
*As denominator or on right hand side*

their  $7y - 3 = \text{their } (y + 1)(2y - 3)$  M1 dep  
*dep on both M1s, need quadratic*

$2y^2 - 8y = 0$  A1  
*Allow  $2y^2 = 8y$  or  $y^2 = 4y$*

$y = 0$  or  $4$  A1