Revision F4 (Topics 11-16) [51] MARKSCHEME
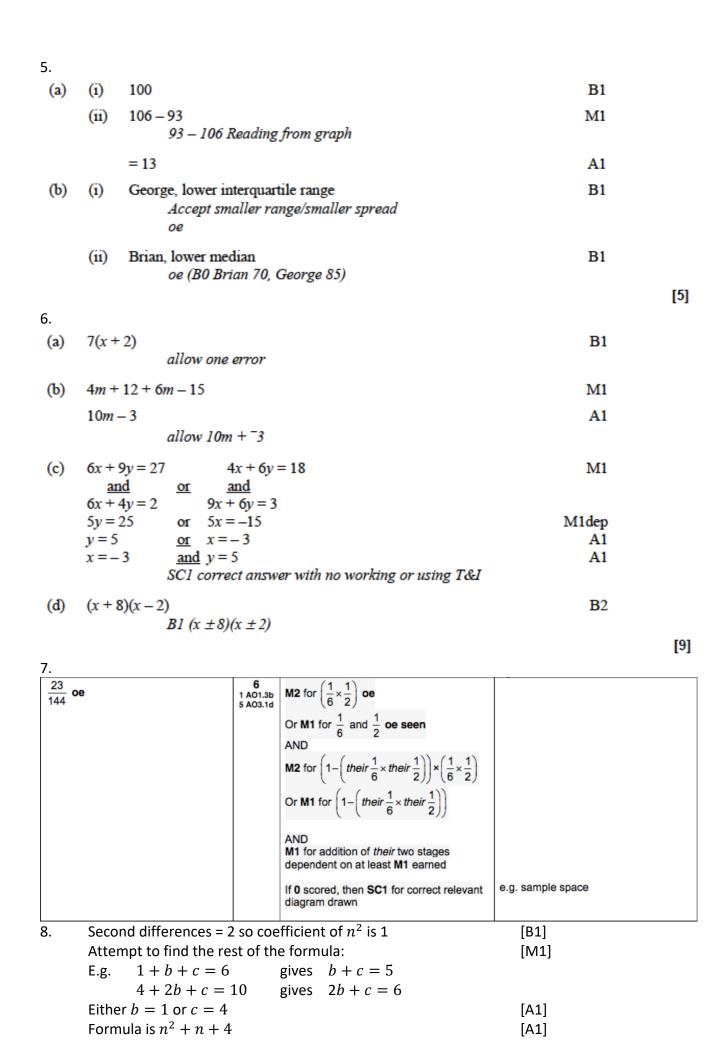
1.

(a)   Odd   B1
           Any clear indication

(b)   (i)   5, 9, 13   B2
               – 1 each error or omission
               1, 5, 9 scores B1
               9, 13, 17 scores B1

      (ii)   No and valid reason   B1
               eg 121 is in the sequence
               (all) terms are odd
               122 is even
               121 ÷ 4 is not an integer
               Note: "No" can be implied

                                                  [4]

2.

(a)   Using frequency densities   M1
      Correct frequency densities   A1
      Height & widths plotted correctly   B1
              At least 2 correct   *Look for consistent use of 'key'*
              4 out of 5 correct … look for evidence on graph
              ± ½ square for their vertical scale

(b)   Good attempt to 'halve' the area 735 minutes   M1 A1
              Or halving the frequency + attempt at calculation
              (could be a cum. freq. calculation)

                                                  [5]

3.

$-\frac{1}{6}$ with working shown including explanation for discounting $w = {}^-3$	**6** 1 AO1.3b 1 AO2.4a 4 AO3.1b	**B1** for $x^2 = (w + 1)$ **M1** for $y = 6(\textit{their } x^2)^2 + 7(\textit{their } x^2)$ **M1** for *their* $y = 10$ and make $= 0$ **M1** for solving a three term quad with $a \neq 1$ **B1** for discounting a value of w less than ${}^-1$	$w = -\frac{1}{6}$ and ${}^-3$ **OR** $w = {}^-3$ implies 5 marks

4.

(a) $r^4(r^2 - 3)$ B1

(b)   (i) $(x + a)(x + b)$ M1
               $ab = \pm 14$

          $(x + 7)(x - 2)$ A1

      (ii) $-7, 2$ B1 ft
              ft from two linear brackets

                                                    [4]

5.

(a) (i) 100   **B1**

  (ii) $106 - 93$ **M1**

       93 – 106 Reading from graph

       $= 13$ **A1**

(b) (i) George, lower interquartile range   **B1**

       Accept smaller range/smaller spread

       oe

  (ii) Brian, lower median   **B1**

       oe (B0 Brian 70, George 85)

                                                        [5]

6.

(a) $7(x + 2)$ **B1**

       allow one error

(b) $4m + 12 + 6m - 15$ **M1**

       $10m - 3$ **A1**

       allow $10m + {}^-3$

(c)
$$\begin{array}{lll} 6x + 9y = 27 & & 4x + 6y = 18 \\ \underline{\text{and}} & \text{or} & \underline{\text{and}} \\ 6x + 4y = 2 & & 9x + 6y = 3 \\ 5y = 25 & \text{or} & 5x = -15 \\ y = 5 & \text{or} & x = -3 \\ x = -3 & \text{and} & y = 5 \end{array}$$
     M1, **M1dep**, **A1**, **A1**

       SC1 correct answer with no working or using T&I

(d) $(x + 8)(x - 2)$ **B2**

       B1 $(x \pm 8)(x \pm 2)$

                                                         [9]

7.

| $\dfrac{23}{144}$ **oe** | **6**
1 AO1.3b
5 AO3.1d | **M2** for $\left(\dfrac{1}{6} \times \dfrac{1}{2}\right)$ **oe**

Or **M1** for $\dfrac{1}{6}$ and $\dfrac{1}{2}$ **oe seen**
AND
M2 for $\left(1 - \left(\textit{their}\,\dfrac{1}{6} \times \textit{their}\,\dfrac{1}{2}\right)\right) \times \left(\dfrac{1}{6} \times \dfrac{1}{2}\right)$

Or **M1** for $\left(1 - \left(\textit{their}\,\dfrac{1}{6} \times \textit{their}\,\dfrac{1}{2}\right)\right)$

AND
M1 for addition of *their* two stages
dependent on at least **M1** earned

If **0** scored, then **SC1** for correct relevant
diagram drawn |

e.g. sample space |

8.

Second differences = 2 so coefficient of n^2 is 1   **[B1]**

Attempt to find the rest of the formula: **[M1]**

E.g. $1 + b + c = 6$ gives $b + c = 5$

         $4 + 2b + c = 10$ gives $2b + c = 6$

Either $b = 1$ or $c = 4$ **[A1]**

Formula is $n^2 + n + 4$ **[A1]**

9.

$$\frac{4}{12} \times \frac{3}{11} \times \frac{2}{10}$$

M1,M1

0.018...

M1

1000× their (0.018...)

M1

comparison of 18 with 16

$$\frac{16}{1000}$$

comparison of 0.018... with 0.016

[4]

10.

BC/1 = (BC + 5)/4

M1

If attempt made to find angle at B
with horizontal. sin⁻1(3 ÷ 5) M1

$4x = x + 5$

A1

Angle = 36.869.... A1
1:3 M1,A1   1:4 M1,A0

$x = \dfrac{5}{3}$

A1

4 ÷ sin 36.89.. M1
BC = 5/4 A1 ft

$AC = 6\dfrac{2}{3}$

A1

Accept decimals or equivalent
fractions.
AC = 6.25 A1 ft.

[4]