

**Arithmetic Sequences and Series Past Paper Answers Edexcel Maths**  
**IGCSE Higher- Calculator**

1.

	$4n + 3$	2	B2oe	e.g. $7 + 4(n - 1)$ or $4n + (7 - 4)$ etc allow $T_n = 4n + 3$ or $x = 4n + 3$ etc  If not B2 then award B1 for answer of $4n + k$ ( $k \neq 3$ ) or $n = 4n + 3$
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2.

Question	Working	Answer	Mark	Notes
	<b>Mark scheme 1 (see next page for alternative mark scheme)</b>			
2	$(8x + 2) - (2x + 23) (= 6x - 21)$ or $(2x + 23) - (8x + 2) (= -6x + 21)$ or $(20x - 52) - (8x + 2) (= 12x - 54)$ or $(8x + 2) - (20x - 52) (= -12x + 54)$  $(8x + 2) - (2x + 23) = (20x - 52) - (8x + 2)$ oe or $(2x + 23) - (8x + 2) = (8x + 2) - (20x - 52)$ oe  $x = 5.5$  Eg $2 \times 5.5 + 23 (=34)$ and $8 \times 5.5 + 2 (=46)$ <b>OR</b> $8 \times 5.5 + 2 (=46)$ and $20 \times 5.5 - 52 (=58)$	shown	4	M1 for a correct expression for the common difference in terms of $x$ brackets must be present or removed correctly  M1 for a correct equation  A1  A1 for 12 from correct working

3.

3	(a)		$6n + 4$	2	M1 for $6n + k$ ( $k$ may be 0 or absent) oe  A1 oe eg $10 + (n - 1)6$ or $n \times 6 + 4$
	(b)	...40, 46, ... -2, 1, 6, 13, 22, 33 46 ...  $6n + 4 = n^2 - 3$ oe	e.g. 22 or 46	2	M1 continuing sequence and writing at least 5 terms of 2 <sup>nd</sup> sequence – allow one error or  for a correct equation ft part (a)  A1 or other number in both sequences eg -2

4.

Question	Working	Answer	Mark	Notes
23	$a + 9d = 66$ oe  $\frac{20}{2}(2a + 19d) = 1290$ oe $a = 93$ or $d = -3$	81	4	M1 A correct formula involving 10 <sup>th</sup> term  M1 Correct formula for sum of first 20 terms  A1 A correct value for $a$ or $d$  A1 dep on M2

5.

	$7n - 5$ oe	2	AO1	M1 for $7n + k$ ( $k$ may be zero) A1
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6.

$\frac{48}{2}(2a+(48-1)d)$ or $\frac{36}{2}(2a+(36-1)d)$ oe		5	M1 For a correct expression for the first 48 terms or the first 36 terms
$\frac{48}{2}(2a+(48-1)d) = 4 \times \frac{36}{2}(2a+(36-1)d)$ oe			M1 For a correct equation.
$96a + 1392d = 0$ oe eg $4a + 58d = 0$ , $2a + 29d = 0$ or $a = -14.5d$ etc			M1
$\frac{30}{2}(2a+(30-1)d)$			M1 Indep Allow substitution of any 'found' values of $a$ and $d$
	0		A1
<b>Total 5 marks</b>			

7.

(a)	$S_{10} = \frac{10}{2}[2a + 9d]$ or $S_{10} = a + a + d + a + 2d + a + 3d + a + 4d + a + 5d + a + 6d + a + 7d + a + 8d + a + 9d$ $162 = 10a + 45d$ *	M1  A1cso  (2)
(b)	$(u_n = a + (n-1)d \Rightarrow ) 17 = a + 5d$  $10 \times (b)$ gives $10a + 50d = 170$ $(a)$ is $10a + 45d = 162$  Subtract $5d = 8$ so $d = \underline{1.6}$ o.e.  Solving for $a$ $a = 17 - 5d$  so $a = \underline{9}$	B1  (1)  M1  A1  M1  A1  (4) 7

8.

(a)	$a + 17d = 25$ or equiv. (for 1 <sup>st</sup> B1), $a + 20d = 32.5$ or equiv. (for 2 <sup>nd</sup> B1),	B1, B1 (2)
(b)	<u>Solving</u> (Subtract) $3d = 7.5$ so $d = \underline{2.5}$ $a = 32.5 - 20 \times 2.5$ so $a = \underline{-17.5}$ (*)	M1 A1cso (2)
(c)	$2750 = \frac{n}{2} \left[ -35 + \frac{5}{2}(n-1) \right]$ { $4 \times 2750 = n(5n - 75)$ } $4 \times 550 = n(n - 15)$ <u><math>n^2 - 15n = 55 \times 40</math></u> (*)	M1A1ft  M1 A1cso (4)
(d)	$n^2 - 15n - 55 \times 40 = 0$ or $n^2 - 15n - 2200 = 0$ $(n - 55)(n + 40) = 0$ $n = \dots$ <u><math>n = 55</math></u> (ignore - 40)	M1 M1 A1 (3) <b>[11]</b>

9.

(a)	$u_{25} = a + 24d = 30 + 24 \times (-1.5)$ $= -6$	M1 A1 (2)
(b)	$a + (n - 1)d = 30 - 1.5(r - 1) = 0$ $r = 21$	M1 A1 (2)
(c)	$S_{20} = \frac{20}{2} \{60 + 19(-1.5)\}$ or $S_{21} = \frac{21}{2} \{60 + 20(-1.5)\}$ or $S_{21} = \frac{21}{2} \{30 + 0\}$ $= 315$	M1 A1ft  A1 (3) <b>7</b>