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Paper 3 (Core) **October/November 2016**

MARK SCHEME

Maximum Mark: 96

Published

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Abbreviations

awrt answers which round to
cao correct answer only
dep dependent
FT follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
nfww not from wrong working
soi seen or implied

Question	Answer	Marks	Part Marks
1 (a)	trapezium triangle square parallelogram	**1** **1** **1** **1**	
(b) (i)	2	**1**	
(ii)	2 correct lines	**2**	**B1** for 1 correct line and no incorrect or for 2 correct lines but ⩾1 incorrect
2 (a) (i)	38	**1**	
(ii)	6	**1**	
(iii)	67	**2**	**B1** for 35 and 32 soi
(b)	4400	**2**	**B1** for 4375
(c)	5	**3**	**B2** for answer 4 or 4.25 or **M1** for (175 + 12) ÷ 44 soi
3 (a) (i)	130	**1**	
(ii)	Obtuse	**1**	
(b)	147 57 33	**1** **1** **1**	
4 (a)	Correct pattern	**1**	
(b)	13, 16	**1**	
(c)	+3 oe	**1**	
(d)	Sarah, with correct justification	**3**	**M2** for substituting one value bigger than or equal to 2 into both formulae or **M1** for any substituting into either formula

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5	**(a)**	62.5 oe	**2**	**M1** for $6\frac{1}{4}\times 10$ oe
	(b)	12 min 30 sec	**4**	**B3** for 12.5 minutes seen or **M2** for 6.25 ÷ 30 × 60 oe or **M1** for 6.25 ÷ 30 oe
6	**(a)**	57	**2**	**B1** for 12 or 45 seen or **M1** for 6 × 2 + 9 × 5 seen
	(b)	$5x$ +13	**2**	**B1** for $5x$ or [+]13 seen
	(c)	$3(2x + 3y)$	**1**	
7	**(a)**	24	**2**	**M1** for 6 × 8 ÷ 2 soi
	(b)	336	**3FT**	**FT** 288 + 2×*their* (a) **M2** for 12 × 8, 12 × 10 and 12 × 6 soi or **M1** for any two of 12 × 8, 12 × 10, 12 × 6 soi
	(c)	288	**1FT**	**FT** 12×*their* (a)
8	**(a)**	16.11	**3**	**M2** for 8.95 ÷ 5 × 9 or **M1** for 8.95 ÷ 5
	(b)	1.38	**3**	**M2** for 1.20 × 1.15 oe or **M1** for 1.20 × 0.15 oe
	(c)	12	**3**	**M2** for (5.50 – 4.84) ÷ 5.50 oe or **M1** for 4.84 ÷ 5.50 oe
9	**(a)**	10	**1**	
	(b)	2	**3**	**M1** for $6x – 3 = 9$ or for $2x – 1 = 3$ **M1** for $6x = 12$ or for $2x = 4$
	(c)	$4\frac{1}{2}$ oe	**3**	**M2** for $7x – 3x$ seen and 20 − 2 seen or **M1** for $7x – 3x$ seen or 20 − 2 seen
10	**(a)**	[0.75, 1.5] 3, 6, 12, 24	**1**	
	(b)	Correct curve	**1** **1**	**B1** for correct shape **B1** for crosses y-axis at approximately 3
	(c) (i)	Correct line	**1**	Above where curve crosses y-axis
	(ii)	1.415 to 1.42	**1**	

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11	**(a)**	Steve Median = 27 IQR = 13	 **1** **2**	 **B1** for 30 or 17 seen
	(b)	Tam Median = 23 IQR = 11 or 11.5	 **1** **2**	 **M1** for 28 or 28.5 or 17 seen
	(c)	Steve's plants are taller oe Tam's plants have a more consistent height oe	**1** **1**	
12	**(a)**	[0.455] 0.21, 0.335	**2**	**M1** for $n \div 200$ soi
	(b)	Large amount of trials oe	**1**	
	(c)	1675	**2**	**M1** for *their* $\frac{67}{200} \times 5000$
	(d)	0.665	**2**	**M1** for 0.455 + *their*(0.21)
13	**(a)**	1.17×10^{13}	**2**	**B1** for 9×10^{16} seen
	(b)	[0].00013	**1**	
	(c)	$\sqrt{\frac{E}{m}}$ oe	**2**	**M1** for $c^2 = \frac{E}{m}$ or **SC1** for answer $\frac{\sqrt{E}}{m}$
14		826 or 825.6 to 825.7	**6**	**M1** for 3×100 **M1** for 4×80 **M1** for 2×40 **M2** for $\frac{1}{2} \times \pi \times 80$ or **M1** for $\pi \times 80$
15	**(a)**	8.13 or 8.127…	**2**	**M1** for $4.6^2 + 6.7^2$ seen
	(b)	27.6 or 27.64…	**3**	**M2** for $10.8 \div \sin 23$ or **M1** for $\sin 23 = \frac{10.8}{y}$

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