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**MATHEMATICS**

**6880/03**

Paper 3 Calculator Structured Questions (Core and Extended)

**October/November 2018**

**2 hours**

Candidates answer on the Question Paper

Additional Materials:      Electronic calculator  
                                 Geometrical instruments  
                                 Mathematical tables (optional)  
                                 Tracing paper (optional)

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***Confidential***

***MARK SCHEME***

***{6880/03}***

***MARKS: 100***

QTN	ANSWER	MARKS	TOTAL
<b>1(a)</b>	$7x$ OR $9x - 2x$	1	
<b>(b)(i)</b>	$7x = 21$ their $7x = 21$ $x = 3$	1 1	
<b>(ii)</b>	$\frac{1}{21} \begin{pmatrix} 3 & -3 \\ -2 & 9 \end{pmatrix}$	3	
		2	<b>6</b>
<b>2(a)</b>	$\frac{437.5 \times 100}{87.5}$ (E)500	2 1	
<b>(b)</b>	$\frac{107.2}{100} \times 120$ (=E)128.64 oe  $\frac{92.8}{100} \times 128.64$ oe (E)119.38	1  2  1	
			<b>7</b>
<b>3(a)</b>	$\sqrt{10^2 + 10^2}$ 14.14 or 14.1	1 1	
<b>(b)</b>	$\frac{1}{2} \sqrt{200}$ their (a) $\div 2$ —— 7.07 (cm)	1 1	
<b>(c)(i)</b>	$\frac{1}{3} \times 10 \times 10 \times$ their 7.07 —— 236 (cm <sup>3</sup> ) or 235 Bran 235.6667	1 1	
<b>(ii)</b>	$\frac{1}{2} \times \frac{4}{3} \times \pi \times 7.07^3$ 740 – 236 i.e. subtracting their 236 498.88 to 505	1 1 1	
			<b>9</b>
<b>4(a)</b>	$\pi(1 - 2x)(3 + x)$	1	
<b>(b)(i)</b>	$\pi(1 - 2x)(3 + x) + \pi(1 - 2x)^2$ (= $10\pi$ ) $3 - 5x - 2x^2 + 1 - 4x + 4x^2 = 10$ $2x^2 - 9x - 6 = 0$	1 1 1	
		1	

QTN	ANSWER	MARKS	TOTAL
(ii)	For $\frac{p \pm q}{r}$ where $p = 9$ and $r = 4$ $q^2 = 129$ or $q = 11.358$ $5.09, -0.59$ Strict for 2d.p.	1 1 2	<b>8</b>
5(a)	$\frac{1}{2} \times 5.8 \times 7.6 \sin 33$ 12.0 cm <sup>2</sup>	2 1	isolating Sin G  Con G
(b)	$(f^2) = 5.8^2 + 8.6^2 \pm 2 \times 5.8 \times 7.6 \cos 33$ $5.8^2 + 8.6^2 - 2 \times 5.8 \times 7.6 \cos 33$ $107.6 - 88.16 \cos 33$ , not $3.3 \cos 33$ $4.89 (= 4.2)$	1 1 1 1	
(c)(i)	$\frac{\sin G}{7.6} = \frac{\sin 33}{4.9}$ or $\frac{\sin 33}{4.2}$ $\sin G = \frac{7.6 \sin 33}{4.9}$ $\frac{7.6 \sin 33}{42}$ $57.6$ $80.2^\circ$	1 1 1	
(ii)	$\frac{\text{their}(a) \times 2}{5.8}$ oe 4.14 (cm)	2 1	
<b>13</b>			
6(a) (i)	A (1, 4) B(4, 1)	3	<b>12</b>
(ii)	$x = y$	1	
(iii)	(2, 2)	2	
(b) (i)	$\frac{-2 + 0.5}{2}$ $2(\text{their}(i))^2 + 3(\text{their}(i) - 2)$	1 1	
	$(-\frac{3}{4}, -3\frac{1}{8})$	1	
(ii)	$-2 \leq x \leq 0.5$	2	
(iii)	$x > \frac{-3}{4}$	1	
7(a)	$40^{(0)}$	2	

QTN	ANSWER	MARKS	TOTAL
(b)	160 <sup>(o)</sup> or 200 (obtuse)	2	7
(c)	80 <sup>(o)</sup> or $\frac{1}{2}$ their acute (b)	1	
(d)	10 <sup>(o)</sup>	2	
8(a)	$m = \frac{7}{9}$ and $n = \frac{3}{5}$	2	11
(b)(i)	$\frac{4}{7} \times \frac{7}{9} \times \frac{2}{5}$ $\frac{56}{315}$ oe $\frac{8}{45}$	1 1	
(ii)	$\frac{3}{7} \times \frac{7}{9} \times \frac{2}{5} + \frac{4}{7} \times \frac{2}{9} \times \frac{2}{5} + \frac{4}{7} \times \frac{7}{9} \times \frac{3}{5}$ $\frac{2}{15} \times \frac{16}{315} \times \frac{4}{15}$ $\frac{142}{315}$	2 1 2	
(iii)	$\frac{3}{7} \times \frac{2}{9} \times \frac{2}{5} + \frac{3}{7} \times \frac{7}{9} \times \frac{3}{5}$ $\frac{4}{105} \times \frac{1}{5}$	1	
(c)	$\frac{75}{315}$ of $\frac{5}{21}$ Only males in Mr Dlodlu's committee Key words men x only no women of females	1	
9(a)	(s) =30 (t) = 49, (u) =77	1 1	
(b)	All 6 points correctly plotted Smooth curve through all plotted points of which 5 are correct (30,0), (40,10) (45,19) (50,30) (55, 49) (60,77) (70,100)	2 1	
(c)(i)	(UQ) = 59 ±2 (LQ) = 48 ±2 their UQ – their La IQR = 11 ±4 21 ±2	1 1 1 1	
(ii)	79 ± 2	2	
10(a)	$2(x - 1) = 4(x + 3)$ or $2(x + 1) = 4(x +$	1	or

QTN	ANSWER	MARKS	TOTAL
	3)	1	
	$-14 = 2x$	1	
	$x = -7$		
	$-10 = 2x$		
	$x = -5$		
(b)	$\frac{(t+4)(t-3)}{2(t^2-16)}$	1	
	$\frac{(t+4)(t-3)}{2(t+4)(t-4)}$	1	
	$\frac{t-3}{2(t-4)}$	1	
(c)		3	
	$\frac{8}{27}$	1	
		1	
d)(i)	$3(z+5)+1$	1	
	$3z+16$	1	
	$3z = y - 16$	1	
	inde	1	
	$(hk)^{-1}(z) = \frac{z-16}{3}$	1	
(ii)		1	
	$k^{-1}(3) = -2$ or $k^{-1}(2) = 2-5$	1	
	$h(-2) = 3(-2)+1$ $hk^{-1} = 3()+1$	1	
	$= -5$		
			<b>16</b>