KENT RIDGE SECONDARY SCHOOL
Preliminary Examination P1 2022

Marking Scheme

MATHEMATICS **4048/01**

SECONDARY 4 EXPRESS/ 5 NORMAL ACADEMIC

18 August 2022 **2 hours**

Question	Solution	Mark/ Remark
Q1	-0.876	[B1]
Q2 (a)	$y = k(3x+7)^2$ $6 = k(-12+7)^2$ $k = 6/25$ or 0.24 $y = 0.24(3x+7)^2$ OR $y = 6/25(3x+7)^2$	[M1] [A1]
Q2(b)	$15.36 = 0.24(3x+7)^2$ $64 = (3x+7)^2$ $3x + 7 = 8$ or -8 $x = 1/3$ or $x = -5$	[M1 15.36 ÷ their k seen] [A1 both answer must be seen]
Q3	$\frac{4}{aw^2} \div \frac{16a^3}{5w}$ $= \frac{4}{aw^2} \times \frac{5w}{16a^3}$ $= \frac{5}{4wa^4}$	 [M1× and 5/4 seen] [A1]

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Q4	1. The scale on the vertical axis does not start from zero. 2. The scale on the axes are inconsistent/ not equally spaced, therefore projection of the profit will be inaccurate. 3. Data from 2013 to 2022 cannot be used to predict future profit. 4. 2015 to 2022 is not linear.	[B1 for point 1 only] [B1 Either point 2 or 3 or 4 only]
Q5	Ratio of the side regular hexagon : equilateral triangle = 7: 3 Ratio of the perimeters hexagon : triangle = 7 × 6 : 3 × 3 = 42: 9	
Q6	Let x be the time taken in hour when they meet $70x + 50x = 100$ $120x = 100$ $x = 5/6$ hours = 50 minutes 0800 + 0050 = 0850 They will meet at 0850 or 8.50 am **OR** Let y be the distance $(100 - y) / 50 = y / 70$ $50y = 7000 - 70y$ $120y = 7000$ $y = 700/12$ time taken = (700/12) /70 = 5/6 hours = 50 minutes 0800 + 0050 = 0850 They will meet at 0850 or 8.50 am	[M1] [M1 5/6 h or 50 min] [A1] [M1] [M1 distance /speed] [A1]
Q7 (a)	4/5 or 0.8 or 80%	[B1] [B0 for 8/10]
Q7(b)	$r + s = 8$ $r \times s$ = Prime therefore $r = 1$ and $s = 7$ P(choosing a red ball) = 0.1 or 1/10	[M1 able to deduce 1 and 7] [A1]

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Q8	$\frac{x}{3} - \frac{3x-7}{4} = 8$ $\frac{4x}{12} - \frac{9x-21}{12} = 8$ $4x - 9x + 21 = 96$ $-5x = 75$ $x = -15$	[M1 common deno] [M1 multiply by 12 and allow 1 slip, the slip cannot be the negative sign] [A1]
Q9(a)	$-8a - 4b + 7b - 21a$ $= 3b - 29a$	[M1 any 2 terms are expanded correctly]
Q9 (b)	$= 6x\,(2y + x)\ - (2y + x)$ $= (6x - 1)\,(2y + x)$	[M1 allow 1 slip] [A1] [A0 if 1 slip is found]
Q10	$3b + 8d = 2ab + 5$ $3b - 2ab = 5 - 8d$ $b(3 - 2a) = 5 - 8d$ $b = \frac{5-8d}{(3-2a)}$	[M1 regroup **and** factorise b] [A1]
Q11	$7/9 \times 1440 = 1120$ $\frac{1}{3} : \frac{5}{6} : 0.5 = 2 : 5 : 3$ 10 units represent 1120 5 units represent 560 OR $\frac{\frac{5}{6}}{(\frac{1}{3}+\frac{5}{6}+\frac{1}{2})} \times 1120 = 560$	[M1 for 1120 or 2: 5: 3 is seen] [A1] [M1 + A1]

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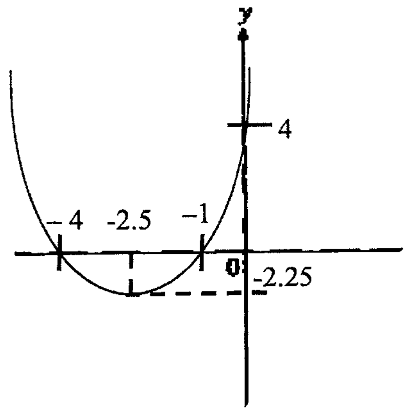
Q12 (a)	$x^2 + 5x + 4$ $= (x + 2.5)^2 - 2.25$	[B1 $(x + 2.5)^2$ B1 –2.25 if not working is shown]
Q12(b)		[C1 shape (min curve) [P1 1. cuts at the x axis at -1 and -4 with min shape 2. cuts at y axis at 4.
Q12(c)	Min pt (-2.5, -2.25)	[B1 or ECF 1 from (a)]
Q13 (a)	$6.3 \times 10^7 - 4.7 \times 10^6 = 58300000$ $58300000 = 5.83 \times 10^7$	[M1 showing subtraction] [A1 for conversion to standard form] [A0 if 5.8×10^7]
Q13(b)	£5.88 ÷ 5 = £1.176 £1 = SGD $1.70 £1.176 = SGD $1.9992 2.98 – 2.00 = 0.98 United Kingdom is cheaper and by SGD$0.98.	[M1 for comparing 1 litre] [M1 conversion of pound to SGD] [A1 must show UK and **SGD$0.98**]
Q14	$x = 0.8m$ $y = 1.3n$ $x/y = 0.8m/1.3n$ $x/y = 8m/13n$ $8m/13n < m/n$	[M1 for 0.8 or 1.3 shown] [M1 able to show the fraction of x/y OR ECF 1 for their version of fractions]

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	Thus, x/y is lesser than m/n	[B1 must say lesser and show comparison between 8m/13n and m/n] [No B1 if they just conclude]
Q15	r/4 or 40 $2200 = 950 (1+ (r/4)/100)^{10x4}$ $2.315789474 = (1+ r/400)^{40}$ $\sqrt[40]{2.315789474} = (1 + \frac{r}{400})$ $1.021215686 - 1 = r/400$ $0.021215686 \times 400 = 8.49$ $r = 8.49$	[B1] [M1 $\div$ *by their* $\sqrt[x]{y}$ [A1]
Q16(a)	$4 (2^a) = 32$ $2^a = 8$ $a = 3$	[M1 able to show 4 or 2^2] [A1]
Q16(b)	$5^{2(x+2)} \times 5^3 \div 5^{-x} = 5^0$ $5^{(2x+4)+3+x} = 5^0$ $3x + 7 = 0$ $x = -7/3$	[M1 to show $1 = 5^0$ or $5^{2(x+2)} \times 5^3$ [M1 use indices law to combine the power] [A1]

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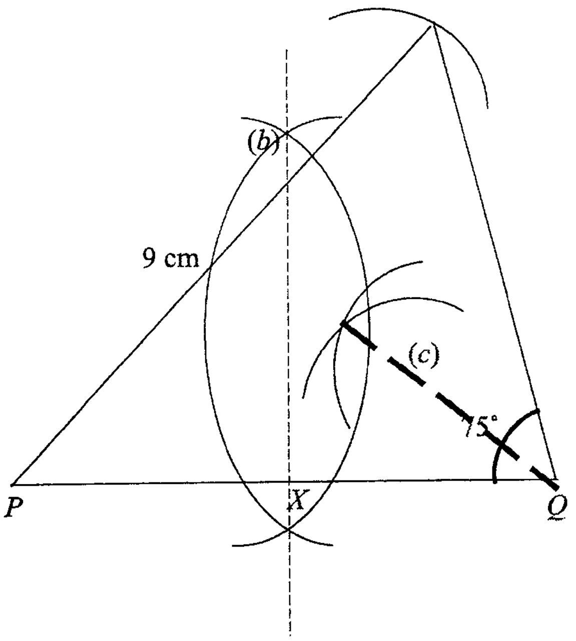
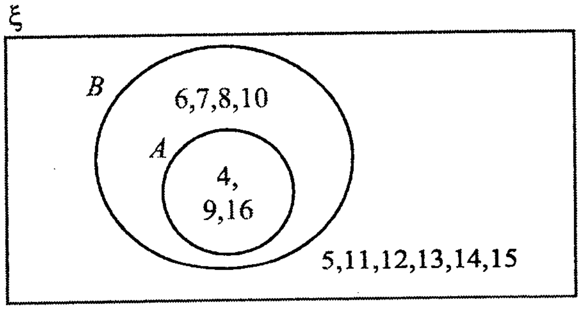
Q17(a)		(a) [C1 for the arc] [G1 for the triangle with $PR = 9$ cm $\pm$ 0.1 cm and $\angle PQR = 75°$ $\pm 1°$] (b) [G1 at PX with 4 cm $\pm$ 0.1] (c) [G1 at $\angle$Q with 37.5°$\pm$1°]
Q18(a)		[C2 – all correct]
Q18(b)	A= {x : x is a **perfect square**}	[B1 bold keyword]
Q18(c)	$A \cap B' = \{\ \}$ or ϕ	[B1] No B1 for {ϕ}
Q19 (a)	2 cm : 1 km 17 cm : 8.5 km	[B1]
Q19(b)	4 cm^2 : 1 km^2 1 cm^2 : 0.25 km^2 9 cm^2 : 2.25 km^2	[M1 conversion] [A1]

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Q20 (a)(i)	$756 = 2^2 \times 3^3 \times 7$	[M1+ A1]
Q20(a) (ii)	$360 = 2^3 \times 3^2 \times 5$ $756 = 2^2 \times 3^3 \times 7$ $HCF = 2^2 \times 3^2$ $= 36$	[B1] [B0 index notation]
Q20 (b)	$m = 11$ $n = 3$	[B1] [B1]
Q21 (a)	$8 - 3.5 = 4.5$ OR By Pythagoras' theorem, $OD^2 = 8^2 - (6.61)^2$ $OD \approx 4.5$ cm (shown)	[B1] must show subtraction from radius
Q21(b)	Area of biggest circle = 64π cm^2 Area of the shaded triangle = $0.5 \times 4.5 \times (13.22)$ $= 29.745$ cm^2 Area of region between 2 concentric circles $= 16\pi$ cm$^2 - 4\pi$ cm^2 $= 12\pi$ cm^2 Area of the unshaded region $= 64\pi$ cm$^2 - 12\pi$ cm$^2 - 29.745$ cm^2 $= 52\pi - 29.745$ cm^2 Cost of shaded region with gold paint $= (12\pi + 29.745) \times \$2$ = \$134.8882237 Cost of unshaded region with silver paint $= (52\pi - 29.745) \times \$1.20$ = \$160.3413816 Total cost of the plaque = \$134.8882237 + \$160.3413816 = \$295.23	[M1 for area of biggest circle or triangle found] [M1] [M1 for unshaded region] [M1 Finding the cost of shaded or unshaded region or ECF 1] [A1 for addition of costs]

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Q22(a)	$3\overrightarrow{AN} = 6\mathbf{b} - 6\mathbf{a}$ $\overrightarrow{AN} = 2\mathbf{b} - 2\mathbf{a}$ or $2(\mathbf{b}-\mathbf{a})$	[M1 for vector AB = 6b- 6a OR 1/3 of their = $\overrightarrow{AB}$ [A1]
Q22(b)	$\overrightarrow{ON} = \overrightarrow{OA} + \overrightarrow{AN}$ $= 6\mathbf{a} + 2\mathbf{b} - 2\mathbf{a}$ $= 4\mathbf{a} + 2\mathbf{b}$ $= 2(2\mathbf{a} + \mathbf{b})$	[B1]
Q22 (c)	$\overrightarrow{NM} = \overrightarrow{OM} - \overrightarrow{ON}$ $= 3\mathbf{b} - (4\mathbf{a} + 2\mathbf{b})$ $= \mathbf{b} - 4\mathbf{a}$ OR $\overrightarrow{NM} = \overrightarrow{NA} + \overrightarrow{AO} + \overrightarrow{OM}$ $= -2\mathbf{b} + 2\mathbf{a} - 6\mathbf{a} + 3\mathbf{b}$ $= \mathbf{b} - 4\mathbf{a}$	[M1 OR $\overrightarrow{NO} + \overrightarrow{OM}$] [A1 shown] [M1] [A1 shown]
Q22(d)(i)	$\overrightarrow{MP} = 3\overrightarrow{MN}$ $\overrightarrow{OP} - \overrightarrow{OM} = 3(-\mathbf{b} + 4\mathbf{a})$ $\overrightarrow{OP} - 3\mathbf{b} = -3\mathbf{b} + 12\mathbf{a}$ $\overrightarrow{OP} = 12\mathbf{a}$	[M1] [A1]
Q22(d) (ii)	$\overrightarrow{OP} = 12\mathbf{a}$ $\overrightarrow{OP} = 2(6\mathbf{a})$ $\overrightarrow{OP} = 2\overrightarrow{OA}$ 1. Since $\overrightarrow{OP} = 2\overrightarrow{OA}$, OP // OA. 2. A is the common point, O, A and P are collinear. 3. OP is twice the length of OA. 4. $\lvert OP\rvert = 2\lvert OA\rvert$	[B1 with working] [B1 with working] [B1] [B1 magnitude]

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Calculator Model:

KENT RIDGE SECONDARY SCHOOL
PRELIMINARY EXAMINATION 2022

MATHEMATICS
PAPER 2 **4048/02**

SECONDARY 4 EXPRESS/ 5 NORMAL (ACADEMIC)

Tuesday 23 Aug 2022 **2 hours 30 minutes**

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Name: ____________________ (   ) **Class: Sec** ____________

MARK SCHEME

The total number of the marks for this section is **100**.

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Total	100

Penalty:

1. Poor presentation for algebraic notations and solving equations (–1 overall)

2. Accuracy errors (–1 overall)

This Question Paper consists of **24** printed pages, including this page.

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S/n	Solutions	Marks	Comments
1(a)	$5(4x+1) > 3(3-2x)$ $20x+5 > 9-6x$	M1	
	$26x > 4$ $x > \frac{2}{13}$	A1	Do not accept $x > 0.154$
1(b)	$\left(\frac{b^8}{16a^{12}}\right)^{\frac{1}{4}}$	M1	
	$= \frac{b^2}{2a^3}$	A1	
1(c)	$\frac{x}{(5-2x)^2} + \frac{3}{5-2x}$ $= \frac{x+3(5-2x)}{(5-2x)^2}$	M1	$\frac{x}{(2x-5)^2} - \frac{3(2x-5)}{(2x-5)^2}$ M1
	$= \frac{15-5x}{(5-2x)^2}$	A1	Accept $\frac{5(3-x)}{(5-2x)^2}$ or $\frac{5(3-x)}{(2x-5)^2}$
1(d)	$14x+12y = 66$ .....(1) $15x-12y = 21$ .....(2) (1) + (2): $29x = 87$	M1	Equivalent method or Substitution method
	$x = 3$, $y = 2$	A1,A1	
1(e)	$\frac{(5x+4)(5x-4)}{(5x+4)(3x-1)}$	M2	
	$= \frac{5x-4}{3x-1}$	A1	
Q2: Penalize 1 mark for the entire question if no brackets are written.			
2(a)	$\begin{pmatrix} 430 & 635 & 335 \\ 430 & 585 & 310 \end{pmatrix}$	B1	
2(b)	$\begin{pmatrix} 98 \\ 78 \\ 48 \end{pmatrix}$	B1	
2(c)	$\begin{pmatrix} 107750 \\ 102650 \end{pmatrix}$ Value of both elements correct **and** correct matrix order to award B2	B1 B1	
2(d)	The elements represent the total price of the tickets from **all categories** sold on **Saturday and Sunday respectively**	B1	
2(e)	$(1 \quad 1)$	B1	
3(a)	Volume $= \frac{2}{3}\pi r^3 + \pi r^3 = \frac{5}{3}\pi r^3$	B1	
3(b)	$\frac{2}{3}\pi r^2 h = \frac{5}{3}\pi r^3 + \frac{1}{3}\pi r^2 h$ $\frac{1}{3}\pi r^2 h = \frac{5}{3}\pi r^3$ $h = 5r$ (shown)	M1 A1	

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3(c)	$\frac{2}{3}\pi r^3 = 54\pi$ $r^3 = 81$ $r = 4.3267$	M1	
	Volume of Solid A $= \frac{5}{3}\pi(4.3267)^3 + \frac{1}{3}\pi(4.3267)^2(5 \times 4.3267)$	M1 Ecf	
	$= 848$ cm³ (3sf)	A1	
3(d)	$\frac{1}{2} \times (10+6) \times y \times (20) = 848.2014$	M1	$\frac{1}{2} \times (10+6) \times y$: M1
	Height $= \frac{848.2014}{8\times 20}$	M1 Ecf	
	$= 5.30$ cm	A1	
4(a)	$\frac{WY}{\sin 28.6} = \frac{3}{\sin 20}$	M1	
	$WY = \frac{3}{\sin 20} \times \sin 28.6 = 4.20$ m (3sf)	A1	
4(b)	$4.1988^2 = 7^2 + 10^2 - 2(7)(10)\cos\angle WXY$	M1 Ecf	
	$\angle WXY = \cos^{-1}\left(\frac{7^2+10^2-4.1988^2}{2(7)(10)}\right)$	M1 Ecf	
	$= 20.2^o$ (1dp) shown	A1	
4(c)	Bearing $= 180 - (360 - 308) + 28.6$	M1	$(360 - 308)$ seen: M1
	$= 156.6°$ (1dp)	A1	
4(d)	Height $= \sqrt{8^2 - 7^2} = 3.87$ m (3sf)	B1	
4(e)	Shortest $WT = 7\sin 20.2224 = 2.41966$ m	M1	
	Greatest angle of elevation $= \tan^{-1}\frac{3.87298}{2.41966}$	M1 Ecf	
	$= 58.0°$ (1dp)	A1	

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S/n	Solutions	Marks	Comments
5(a)(i)	$\frac{37}{21}$	B1	
5(a)(ii)	Solving $\frac{6n-5}{3n}=\frac{64}{33}$ $n = 27.5$ Since n is not a positive integer, $\frac{64}{33}$ is not a term in the sequence.	B1	Accept: Since the numerator must always be an odd number, $\frac{64}{33}$ is not a term in the sequence.
5(a)(iii)	$T_n = 2-\frac{5}{3n}$ When $n=1$, $T_1=\frac{1}{3}$ Since $0<\frac{5}{3n}\le\frac{5}{3}$ for integer values of $n\ge 1$, therefore $\frac{1}{3}\le 2-\frac{5}{3n}<2$ Accept since $\frac{5}{3n}>0$, $2-\frac{5}{3n}<2$ or equivalent reasoning.	M1 A1	Finding $T_1=\frac{1}{3}$ M1 Do not accept substituting values of n to give a few cases of T_n.
5(b)(i)	130	B1	
5(b)(ii)	$T_n=(n+1)(n+2)-2$	M1	
	$=n^2+2n+n+2-2$ $=n^2+3n$ (shown)	A1	
5(b)(iii)	$T_k=k^2+3k=208$ $k^2+3k-208=0$	M1	
	$(k+16)(k-13)=0$	M1	
	$k=-16$ (reject), $k=13$	A1	No A1 without method
6(a)	19.25 kg	B1	Accept 19<Q2<19.5
6(b)	IQR = 22.5 − 15.75	M1	Accept 22.25<Q3<23 Accept 15.5<Q1<16
	= 6.75 kg	A1	Accept 6.25<IQR<7.5
6(c)	27.5 kg	B1	
6(d)	On the average, members in Amazing lost more mass as the median mass loss is higher than Supreme (18 kg)	B1	
	The **spread** of the mass loss of the members **in Amazing is smaller** as the **interquartile range of Amazing is smaller than Supreme** (9 kg)	B1	

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6(e)(i)	$\frac{168-20}{200} = \frac{37}{50}$	B1	Accept 0.74
6(e)(ii)	Andy calculated the probability with replacement	B1	
	Correct probability = $\frac{32}{200} \times \frac{31}{199} = \frac{124}{4975}$	B1	Accept 0.0249 (3sf)
7(a)	AD = BE (given)	M2 (all 3)	Accept (angles on a st line). Accept if 60° labelled on diagram to show $\angle BAD = \angle CBE$.
	$\angle CAB = \angle CBA = 60^\circ$ (interior angles of equilateral triangle) $\angle BAD = \angle CBE = 180 - 60 = 120^\circ$ (adj angles on a st line)		
	AB = BC (sides of equilateral triangle)		
	Therefore, $\Delta ABD \equiv \Delta BCE$ (SAS)	A1	Award A1 if M2 awarded
7(b)(i)	Let A be (a, 0): $\frac{6-0}{7-a} = \frac{6-4}{7-3}$ $a = -5$	M1	Finding gradient $\frac{6-4}{7-3}$ M1
	Area = $\frac{1}{2} \times 5 \times 4$	M1 Ecf	
	= 10 units^2	A1	
7(b)(ii)	Let point D be (d, 0). OB // DC $\frac{6-0}{7-d} = \frac{4}{3}$, $d = 2.5$ D is (2.5, 0)	B1	Or scale factor = $\frac{3}{2}$, AD = $\frac{3}{2} \times 5 = 7.5$ units
7(b)(iii)	$\frac{area\ of\ \Delta ABO}{area\ of\ \Delta ACD} = \left(\frac{5}{7.5}\right)^2 = \frac{4}{9}$	M1 Ecf	
	$\frac{area\ of\ OBCD}{area\ of\ \Delta ACD} = \frac{5}{9}$	A1	

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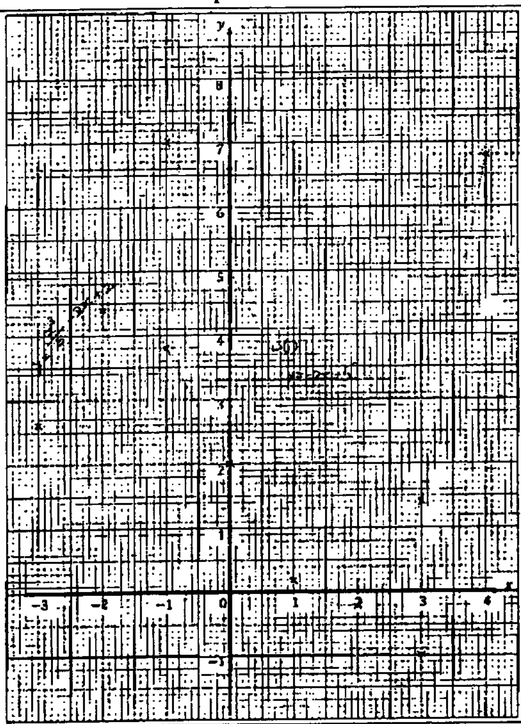
S/n	Solutions	Marks	Comments
8(a)	$p = 2.6$	B1	
8(b)		P2 C1	At least 4 points correct: P1 All 8 points correct: P2
8(c)	Line $y = 5$ **<u>drawn or mentioned</u>** or line indicated on graph to show x-coordinate solution	B1	
	The line $y = 5$ **<u>intercepts the curve at only 1 point</u>**, therefore $\frac{x^3}{5} - 2x = 3$ has only one solution	B1	
8(d)(i)	Line $y = -2x + 5$ drawn for $-1 \le x \le 4$	B1	
8(d)(ii)	$x = 2.45 \pm 0.2$	B1	Refer to their graph
8(d)(iii)	$\frac{x^3}{5} - 2x + 2 = -2x + 5$ $x^3 - 15 = 0$	M1	
	$A = 0, B = -15$	B1,B1	
Q9(a): Penalize 1 mark for each missing reason or wrong reason <u>up to 2 marks</u>			
9(a)(i)	$\angle OEA = 90$ (radius ⊥ tan) $\angle OBA = 360 - 90 - 72 - 38$ (angle sum of quadrilateral)	M1	
	$= 160°$	A1	
9(a)(ii)	$\angle BCE = 72 \div 2 = 36$ (∠ at centre = 2∠ at circumference) $\angle DEB = 180 - (36 + 40)$ (∠s in opp segments)	M1	
	$= 104°$	A1	

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9(a)(iii)	$\angle OBE = (180-72) \div 2 = 54$ ($\angle$ sum of isosceles triangle) $\angle EBA = 160 - 54 = 106$	M1	
	$\angle CBE = 180 - 106 = 74$ (adj $\angle$s on a st. line) $\angle OEC = 180 - 74 - 36 - 54$ ($\angle$ sum of triangle)	M1	
	$= 16°$	A1	
9(b)(i)	$r\theta = 12.785 - 4.5 - 4.5 = 3.785$	M1	
	$\theta = \frac{3.785}{4.5} = 0.841$ rad (3sf)	A1	
9(b)(ii)	The perpendicular from the centre of the circle to chord BD bisects the chord. Hence BM = MD.	B1	Accept $\Delta OMB \equiv \Delta OMD$ (RHS) or The **perpendicular** from the vertex of an **isosceles triangle** bisects the base
9(b)(iii)	Area of minor sector OAB $= \frac{1}{2}(4.5^2)(0.84111) = 8.5162$ cm^2 Alternatively: Area of minor sector OBCD M1 $= \frac{1}{2}(4.5^2)(\pi - 2 \times 0.84111) = 14.7761$ cm^2	M1	
	Area of triangle OBM $= \frac{1}{2}(4.5)(3)\sin(0.84111)$ $= 5.0313$ cm^2 Alternatively: Area of triangle OBD M1 $= \frac{1}{2}(4.5^2)\sin(\pi - 2 \times 0.84111)$ $= 10.0622$ cm^2	M1	
	Shaded area $= \frac{\pi(4.5)^2}{4} - 8.5162 - 5.0313$ $= 2.36$ cm^2 (3sf)	A1	Alternatively: Shaded area $= \frac{1}{2}(14.7761 - 10.0622)$ $= 2.36$ cm^2 (3sf)

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S/n	Solutions	Marks	Comments
10(a)	Electricity tariff rate for Oct-Dec 22 $= 1.08 \times 30.17 = 32.58$ ₵/kWh	B1	
10(b)	Amount paid before GST $= 1195.87 \times \$0.3258 \times 0.94$ $= \$366.2376$	M1	M1 for using 32.58
	Amount paid after GST $= 1.07 \times \$366.2376$	M1	
	$= \$391.87$	A1	Accept \$391.92 for using more accurate 32.5836 ₵/kWh in their calculation
10(c)	**No. of solar panels to be installed = 20** Based on $9 \div 1.65 \approx 5$ (length) and $4 \div 1 = 4$ (width) $5 \times 4 = 20$	P1	No. of solar panels. 20 seen: P1 Accept $9 \times 2 = 18$ panels Do not accept $\frac{9\times4}{1.65\times1} \approx 22$
	Average amount of **electricity produced per month** $= 20 \times 19 = 380$ kWh	E1	P1 $\times$ 19 (Their number of panels $\times$ 19)
	Average **cost per month after solar energy savings** $= (1195.87 - 380) \times \$0.3258 \times 0.94 \times 1.07$ $= \$267.35$	C1	$(1195.87 - \text{E1}) \times \$0.3258 \times 0.94 \times 1.07$ seen: C1 Accept if $\times 0.94$ omitted
	Average **cost of installing** solar panels per month $= 2 \times \$6250 \div (20 \times 12) = \$52.08$	I1	$2 \times \$6250$ seen: I1 If their no. of solar panels > 20, accept $3 \times \$6250$
	Total average amount paid per month $= \$267.35 + \$52.08$ $= \$319.43$ ($< \$391.87$)	T1	**Their C1+ I1**
	Since the average amount paid by Mr Robert after installing the solar panels is less than what he is currently paying, he should proceed with the installation.	A1	Awarded independent of accuracy of T1

Alternative solution for 10(c) based on total cost for 20 years:

No. of solar panels to be installed = 20	P1
Average amount of **electricity produced per month** $= 20 \times 19 = 380$ kWh	E1
Cost for 20 years before solar energy savings $= \$391.87 \times (20 \times 12) = \$94048.80$	C1
Cost of installing solar panels$= 2 \times \$6250 = \$12500$	I1
Total cost for 20 years after solar energy savings including installation costs $(1195.87 - 380) \times \$0.3258 \times 0.94 \times 1.07 \times (20 \times 12) + \$12500 = \$76664.52$	T1
Since $\$76664.52 < \$94048.80$, he should proceed with the installation.	A1

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