General Certificate of Education Ordinary Level 2019
Mathematics 4048/01
Syllabus 4048 Paper 1
SUGGESTED Solutions & Marking Scheme Mark Allocation
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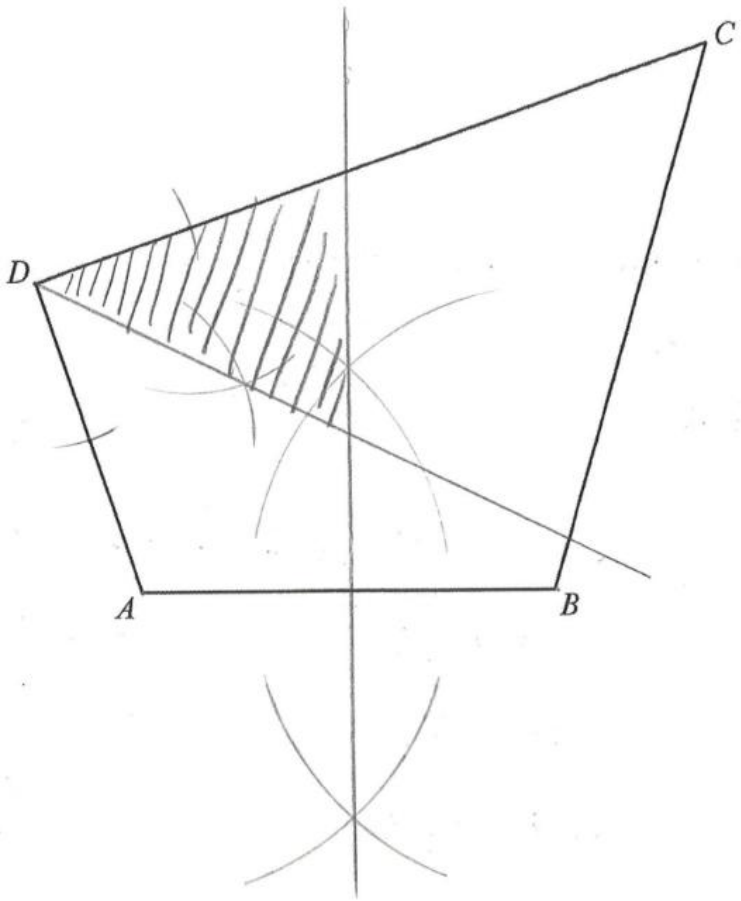
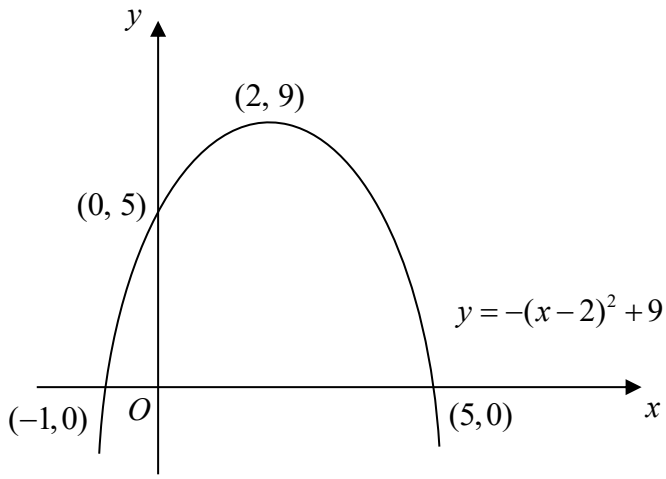
1		350	B1		
					[1]
2		The widths of the cards are not consistent, misleading the reader to think that the areas of the cards are used for comparison.	B1	Relating to the use of areas to mislead reader o.e.	
					[1]
3	(a)	x^4	B1		
	(b)	$a = 8$	B1		
					[2]
4	(a)	$2^3 \times 3^2 \times 5$	B1		
	(b)	$p = 3,\ q = 5$	B1		
					[2]
5		$3200\left(1+\frac{r}{100}\right)^6 = 3890$ $\left(1+\frac{r}{100}\right)^6 = \frac{389}{320}$	M1	Use of compound interest formula and isolate bracket term	
		$r = 100\left(\sqrt[6]{\frac{389}{320}} - 1\right)$ $= 3.307837444 = 3.31$ (3 s.f.)	A1		
					[2]
6		$\frac{1}{2x-3} - \frac{3}{3x-1}$ $= \frac{3x-1-6x+9}{(2x-3)(3x-1)}$	M1	Join fraction	
		$= \frac{-3x+8}{(2x-3)(3x-1)}$	A1		
					[2]
7	(a)	$\frac{17}{20}$	B1	o.e.	
	(b)	$x = 8$	B1		
					[2]

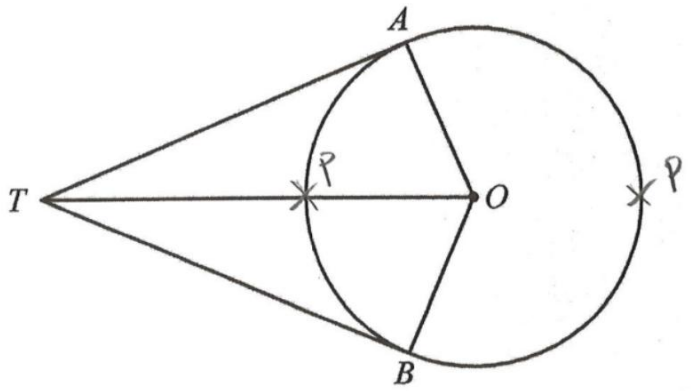
8		$(3p-5)(p+2)=0$	M1	Factorisation only	
		$p=\frac{5}{3}$ or $p=-2$	A2	A1 for each value M0A0	
					[3]
9	(a)	$33\% < \frac{1}{3}$	B1		
	(b)	$6 \le 2x+11$ $-5 \le 2x$ $-\frac{5}{2} \le x$ $2x+11<19$ $2x<8$ $x<4$	M1	Either inequality correctly solved o.e.	
		$-\frac{5}{2} \le x < 4$	A1	o.e.	
					[3]
10	(a)	$P=kQ^2$ (k is a constant)			
		When $Q=\frac{1}{3}$, $P=2$. $2=k\left(\frac{1}{3}\right)^2 \Rightarrow k=54$	M1	Find constant	
		When $Q=\frac{1}{6}$, $P=54\left(\frac{1}{6}\right)^3=\frac{1}{4}$	A1	o.e.	
	(b)	$m=\frac{1}{8}$	B1	o.e.	
					[3]
11	(a)	$\left(x+y^2\right)\left(x-y^2\right)$	B1	c.a.o.	
	(b)	$6ab-2b-3a+1$ $=2b(3a-1)-(3a-1)$	M1	Grouping of terms or M0	
		$=(2b-1)(3a-1)$	A1	or B1 per bracket	
					[3]

12		Refer to diagram below			
	(a)	Angle bisector with arcs	B1		
	(b)	Perpendicular bisector with arcs	B1		
	(c)	Correct shaded area	B1	FT from (a) & (b)	
					[3]
13	(a)	$A(8, -9)$	B1		
	(b)	$\left\|\overrightarrow{AB}\right\| = \sqrt{(-3)^2 + 7^2}$	M1		
		$= 7.615773106 = 7.62$ (3 s.f.)	A1		
					[3]



14	(a)	$137°$	B1		
	(b)	Bearing of T from $D = 137° - 55° = 082°$ Bearing of D from $T = 360° - (180° - 82°)$	M1	$180° - 82°$ s.o.i.	
		$= 262°$	A1		
					[3]
15			B3	B1 for correct shape of curve and relative position B1 for correct coordinates for x- and y-intercepts B1 for correct coordinate of turning point	
					[3]

16	(a)	OT is shared $OA = OB$ (radii of a circle)	M1	Must state both	
		Angle OAT = Angle $OBT = 90°$ (tangent is perpendicular to radius)	M1		
		Triangles OAT and OBT are congruent. (RHS Congruency Test)	A1	Must state RHS	
		Alternative Method 1:			
		OT is shared $OA = OB$ (radii of a circle)	M1	Must state both	
		$TA = TB$ (tangents from external points are equal)	M1		
		Triangles OAT and OBT are congruent. (SSS Congruency Test)	A1	Must state SSS	
		Alternative Method 2:			
		$OA = OB$ (radii of a circle)			
		Angle OAT = Angle $OBT = 90°$ (tangent is perpendicular to radius)	M1		
		$TA = TB$ (tangents from external points are equal)	M1		
		Triangles OAT and OBT are congruent. (SAS Congruency Test)	A1	Must state SAS	
	(b)	Refer to diagram below			
		Two points plotted along the straight line passing through T and O	B1		
					[4]



17	(a)	3.6 km/h	B1		
	(bi)	12.24 pm	B1	Accept 1224	
	(bii)	8 km	B1		
	(d)	$2\frac{2}{9}$ m/s	B1	o.e.	
					[4]
18	(ai)	{5, 6, 10, 15}	B1		
	(aii)	{5}	B1		
	(b)	$R \cap Q = \varnothing$	B1	Deduct B1 for each extra answer	
		$16 \in P$	B1		
					[4]
19		Let the original ratio be $7x : 5x$.			
		$\frac{7x-60}{5x-60} = \frac{3}{2}$	M1	Form equation	
		$14x - 120 = 15x - 180$	M1	Remove fraction	
		$x = 60$	M1	Finds one unit	
		Ann's current amount $= 7(\$60) - \$60 = \$360$	A1		
					[4]
20	(a)	Let h be the height of the smaller bottle.			
		$\frac{h}{30} = \frac{4}{10}$ $h = \frac{4}{10} \times 30$	M1		
		12 cm	A1		
	(b)	Let d be the diameter of the base of this bottle.			
		$\left(\frac{d}{4}\right)^3 = \frac{500}{125}$	M1	Form equation	
		$d = 4 \times \sqrt[3]{4} = 6.349604208 = 6.35$ cm (3 s.f.)			
		6.35 cm	A1		
					[4]

21	(a)	$\mathbf{Q} = \begin{pmatrix} 24 & 14 \\ 29 & x \\ 20 & 15 \end{pmatrix}$	B1		
	(b)	$\mathbf{T} = \begin{pmatrix} 800 & 822 \\ 290+40x & 45x+232 \\ 800 & 835 \end{pmatrix}$	B2	B1 for any 3 correct elements B1 for all elements	
	(c)	$x = 11$	B1		
					[4]
22		Gradient of $AB = \dfrac{-5-1}{7-(-2)} = -\dfrac{2}{3}$	M1		
		Gradient of $PQ = \dfrac{3}{2}$	M1	o.e.	
		$y = \dfrac{3}{2}x + c$ $4 = \dfrac{3}{2}(5) + c \Rightarrow c = -\dfrac{7}{2}$	M1	Find y-intercept o.e.	
		$y = \dfrac{3}{2}x - \dfrac{7}{2}$	A1	o.e.	
					[4]
23	(a)	Measured area $= 6 \times 5 = 30$ cm^2	M1		
		30 cm^2 : 19.2 m^2 1 cm^2 : 0.64 m^2 1 cm : 0.8 m			
		$n = 0.8$	A1		
	(b)	Total varnish needed $= \dfrac{19.2}{16} = 1.2$ litres	M1		
		Least amount $= 2(\$42.50) + \$24$	M1		
		$= \$109$	A1		
					[5]

24	(ai)	180 cm to 200 cm	B1	Must state units	
	(aii)	$178\frac{2}{3}$ cm or 179 cm (3 s.f.)	B1		
	(bi)	24	B1		
	(bii)	48 cm	B1		
	(c)	The heights of the second set of trees are more consistent than the first as the interquartile range of 36 cm is lower than 48 cm, of the first.	B1	Must state values of interquartile range	
					[5]
25	(ai)	$p(2)^2 + q(2) = 11 + 8$ $4p + 2q = 19$ (Shown)	B1 AG		
	(aii)	$p = 8 - q$ $4(8-q) + 2q = 19$	M1	Substitution or elimination s.o.i.	
		$32 - 4q + 2q = 19$ $-2q = -13 \Rightarrow q = 6.5$	A1	o.e.	
		$p = 8 - 6.5 = 1.5$	A1	o.e.	
	(b)	Sum of first 9 terms $= 3(9)^2 + 7(9) = 306$ Sum of first 10 terms $= 3(10)^2 + 7(10) = 370$	M1	Either one calculated	
		10th term of sequence $= 370 - 306 = 64$	A1		
					[6]

END OF MARKING SCHEME