2018-2019 S4 2nd TERM EXAM-MATH-CP 1

18-19 F.4 2nd TERM EXAM MATH CP PAPER 1

> 2018 – 2019 Form 4 Second Term Examination

MATHEMATICS Compulsory Part

PAPER 1

Question–Answer Book

5th June, 2019 8:15 am – 9:45 am (1 hour 30 minutes) **This paper must be answered in English**

INSTRUCTIONS

- 1. Write your name, class and class number in the spaces provided on this cover.
- This paper consists of THREE sections, A(1), A(2) and B.
- Attempt ALL questions in this paper. Write your answers in the spaces provided in this Question – Answer Book. Do not write in the margins. Answers written in the margins will not be marked.
- 4. Unless otherwise specified, all working must be clearly shown.
- 5. Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.
- 6. The diagrams in this paper are not necessarily drawn to scale.



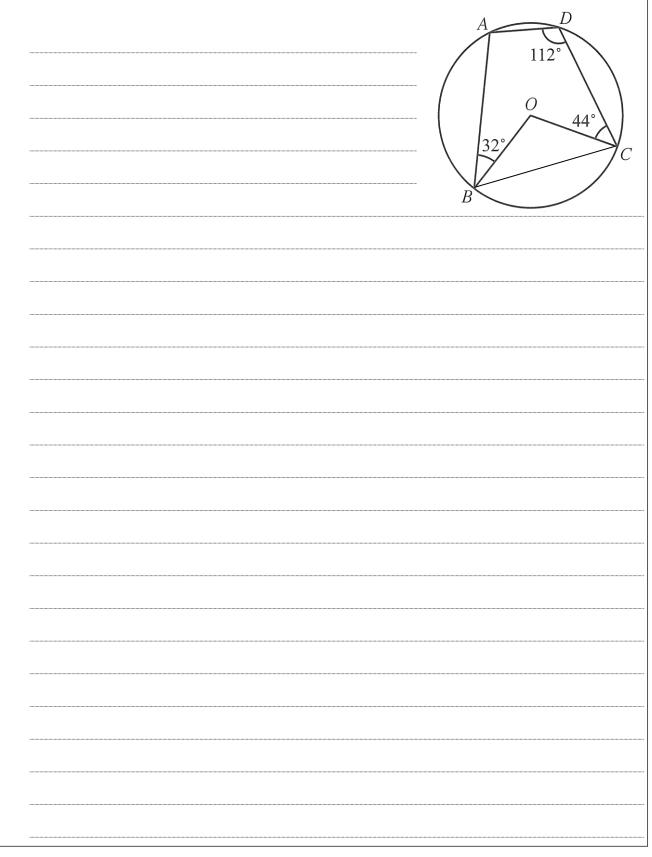
Sections	Marks
A (1 – 4)	/14
A (5 – 10)	/27
A Total	/41
B Total	/29
TOTAL	/70

Section A(1) (14 marks) Simplify $\frac{(3a^{-2}b^3)^2}{a^{-2}b^{-1}}$ and express your answer with positive indices. 1. (3 marks) Answers written in the margins will not be marked. 2. Factorize (a) 2xy - 2y, **(b)** $x^2 - 4x + 3$, (c) $x^2 - 4x + 3 - 2xy + 2y$. (4 marks)

Make *a* the subject of the formula $\frac{6a-2b+3}{4a} = 7$. 3. (3 marks) The cost of a toy car is \$40. It is sold at a profit percentage of 20%. 4. (a) Find the selling price of the toy car. (b) If the marked price of the toy car is \$80, find the discount percentage. (4 marks)

Section A(2) (27 marks)

5. In the figure, *O* is the centre of the circle *ABCD*. It is given that $\angle ABO = 32^\circ$, $\angle ADC = 112^\circ$ and $\angle DCO = 44^\circ$. Find $\angle OBC$ and $\angle BAD$. (4 marks)



Answers written in the margins will not be marked.

(a)	sider the points $A(0, 2)$, $B(2, 1)$ and $C(-4, 4)$. Show that A , B and C are collinear.	(2 marl
(b)	Find the equation of the perpendicular bisector of AC.	(3 marl

(a)		(3 mar
(b)	Sam claims that the equation $x^3 + mx^2 + nx + 15 = 0$ has 3 distinct real roots agree? Explain your answer.	s. Do (3 mar

8.			2) ² +18. The graph cuts the <i>y</i> -axis at <i>B</i> and cuts the
	x-ax	xis at C and D .	۲۷ ۲
	(a)	If AB is a horizontal line, find the	
		coordinates of <i>A</i> . (3 marks)	$y = -2(x+2)^2 + 18$
	(b)		y = 2(x + 2) + 10
		(2 marks)	A
	(c)	If <i>ABDE</i> is a parallelogram, find the	
		coordinates of E . (2 marks)	
			C O D E x
			· · · -

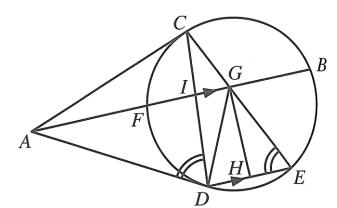
9.	In the figure, <i>OABC</i> is a sector with centre <i>O. AC</i> is the angle bisector of $\angle OAB$.	
	(a) Are <i>AB</i> and <i>OC</i> parallel? Explain your answer. (b) If $\angle AOB = 80^\circ$, find $AB : BC$.	(2 marks) (3 marks)
	(0) II $\angle AOD = \delta 0$, IIII $AD \cdot DC$.	(3 marks)

. Sol	we $7 \cdot 3^{2x-1} = 11$. Give your answer correct to 3 significant figures if necessary.	(3 marks)
	nsider the equation $2x^2 - 4x + k = 0$.	
(a)		(2 marks
(b)	Using the smallest integral value of k in (a), solve the equation.	(2 marks

12.	The loudness of sound L (in dB) is given by $L = 10 \log \frac{I}{I_0}$, where I is the intensity of the
	sound (in W/m ²) and I_0 is the minimum audible sound intensity for a normal person. It is given that $I_0 = 10^{-12}$ W/m ² .
	(a) If the loudness of a sound is 35 dB, find the intensity of the sound. (2 marks)
	(b) Amy claims that if the intensity of the sound in (a) is reduced to $\frac{1}{10000}$ of the original, a
	normal person still can hear the new sound. Do you agree? Explain your answer.(2 marks)

13.	The graph of $y = x^2 + kx + 3$ intersects the straight line $y = 4x + k$ at exactly one p	
	(a) Find the value of <i>k</i>.(b) Find the point of intersection.	(3 marks) (2 marks)

14. In the figure, AC is the tangent to the circle at C. AFIGB, CID and CGE are straight lines. AB // DE and $\angle CED = \angle CDA$.



Prove that

- (a) (i) AD is the tangent to the circle at D.
 - (ii) A, C, G and D are concyclic.
 - (iii) ΔDEG is an isosceles triangle.

(6 marks)

Answers written in the margins will not be marked.

(b) If GH is the angle bisector of $\angle DGE$, prove that the centre of the circle must lie on the line passing through G and H. (3 marks)

through $(8, 2)$ and the x-intercept of G is 2. Express x in terms of y.	(4 mar

Answers written in the margins will not be marked.

End of Paper