

19-20 F.4  
2nd TERM EXAM  
MATH CP  
PAPER 1

2019 – 2020  
Form 4 Second Term Examination

**MATHEMATICS Compulsory Part**  
**PAPER 1**

**Question–Answer Book**

24<sup>th</sup> June, 2020  
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.
2. This paper consists of THREE sections, A(1), A(2) and B.
3. 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)	/28
<b>A Total</b>	<b>/42</b>
<b>B Total</b>	<b>/28</b>
<b>TOTAL</b>	<b>/70</b>

Answers written in the margins will not be marked.

**Section A(1) (18 marks)**

1. Make  $a$  the subject of the formula  $2c(5a + 3b) = 7a$ .

(3 marks)

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2. Simplify  $\frac{b^3}{(2a^6b^{-3})^{-2}}$  and express your answer with positive indices.

(3 marks)

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**3.** Factorize

**(a)**  $8a - 20b$ ,

**(b)**  $6a^2 - 11ab - 10b^2$ ,

**(c)**  $6a^2 - 11ab - 10b^2 - 8a + 20b$ .

(4 marks)

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**4.** The marked price of a vase is \$480. The vase sold at a discount of 25% on the marked price.

**(a)** Find the selling price of the vase.

**(b)** If the profit percentage is 20%, find the cost of the vase.

(4 marks)

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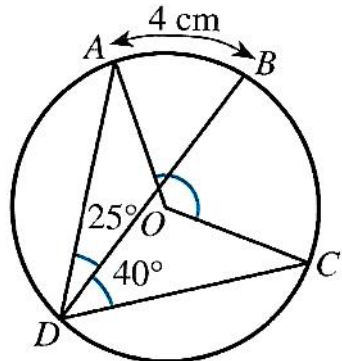
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5. In the figure, if  $\angle ADB = 25^\circ$ ,  $\angle BDC = 40^\circ$  and  $AB = 4$  cm, find  $BC$  and  $\angle AOC$ . (4 marks)



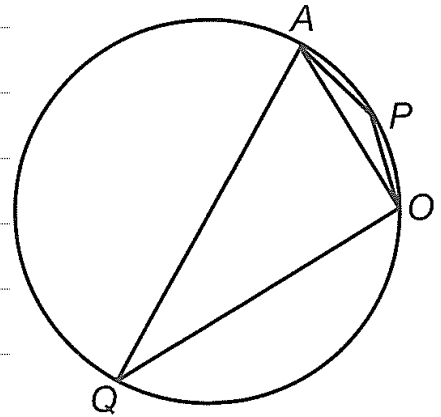
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**Section A(2) (24 marks)**

6. In the figure,  $AQ$  is a diameter of the circle  $APOQ$  and  $\angle APO = 150^\circ$ . Find  $\angle AQO$  and  $\angle QAO$ .  
(5 marks)



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7. Consider  $f(x) = x^3 + 5x^2 - kx - 5$ , where  $k$  is a real constant. When  $f(x)$  is divided by  $x + 2$ , the remainder is 9.

(a) Prove that  $x + 5$  is a factor of  $f(x)$ . (4 marks)

(b) Amy claims that all the roots of  $f(x) = 0$  are distinct. Do you agree? Explain your answer. (2 marks)

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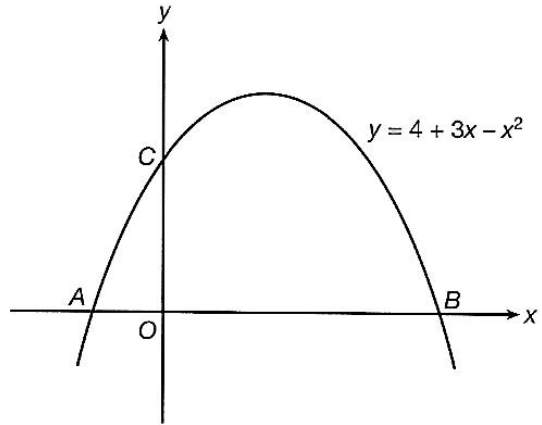
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8. The figure shows the graph of  $y = -x^2 + 3x + 4$ .

(a) Find the coordinates of  $A$ ,  $B$  and  $C$ . (3 marks)

(b) Find the area of  $\triangle ABC$ . (1 mark)

(c) Find the coordinates of the vertex of the graph. (2 marks)



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9. The equations of  $L_1$  and  $L_2$  are  $x - y + 2 = 0$  and  $ax + 2y - 8 = 0$  respectively.

- (a) If  $L_1$  and  $L_2$  are perpendicular to each other, find the value of  $a$ . (3 marks)
- (b) Find the point of intersection of  $L_1$  and  $L_2$ . (2 marks)
- (c) Find the equation of straight line passing through the  $y$ -intercept of  $L_1$  and parallel to  $L_2$ . (2 marks)

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**Section B (28 marks)**

**10.** Solve the equation  $1029 \cdot 49^{x+1} = 3$ .

(3 marks)

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**11.** Solve the equation  $\log(2x + 1) + \log(3x - 7) = \log(11x + 1)$ .

(3 marks)

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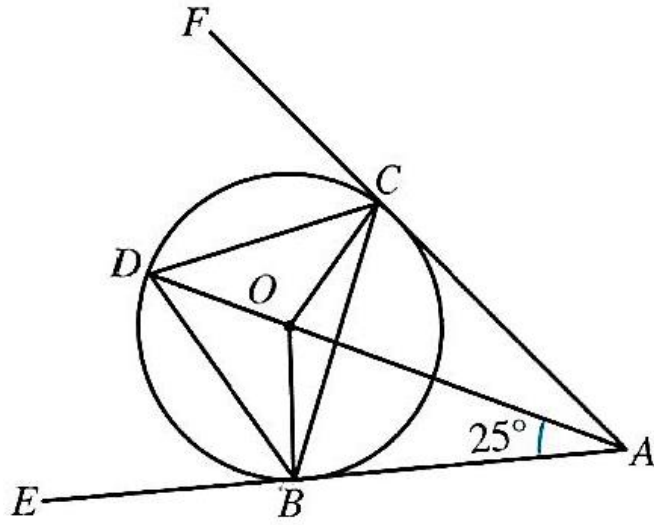
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15. In the figure,  $DOA$ ,  $FCA$  and  $EBA$  are straight lines.  $FA$  and  $EA$  are the tangents to the circle  $BCD$  at  $C$  and  $B$  respectively.



- (a) Find  $\angle BOA$ . (2 marks)  
(b) Show that  $\triangle ABD \cong \triangle ACD$ . (3 marks)  
(c) Hence find  $\angle DBE$ . (3 marks)

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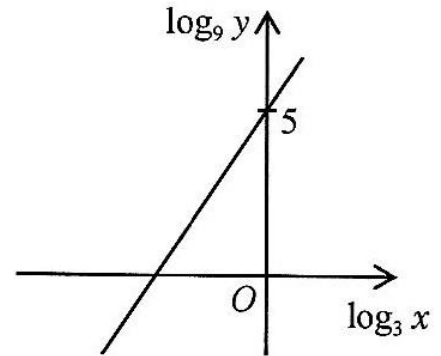
15 continued

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16. The figure shows the linear relation between  $\log_9 y$  and  $\log_3 x$ . The slope and the intercept on the vertical axis of the graph are 3 and 5 respectively. Express the relation between  $x$  and  $y$  in the form  $y = Ax^k$ , where  $A$  and  $k$  are constants. (3 marks)



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**End of Paper**

Answers written in the margins will not be marked.