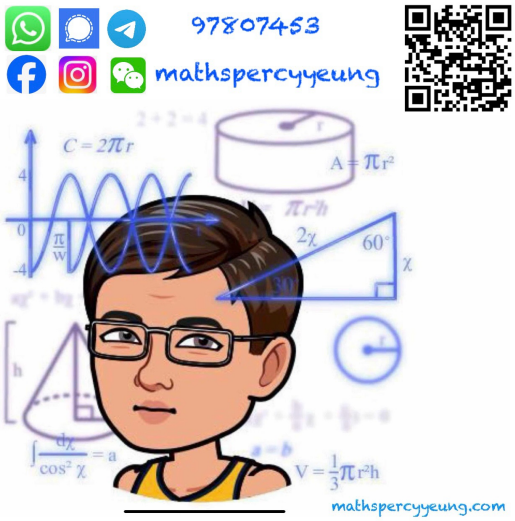


MID YEAR EXAMINATION

2023 – 2024

QUESTION-ANSWER BOOK

Subject: **SECONDARY 2 MATHEMATICS**

Paper: **I**

Time Allowed: **1 HOUR**

Total Marks: **100**

No. of pages: 10

Page	Marks	
2		
3		
4		
5		
6		
7		
8		
9		
10		
Total		

INSTRUCTIONS

(1) Write your name, class and examination number in the spaces provided.

(2) This paper consists of Two Sections, A and B.

(3) Attempt ALL questions in Sections A and B. Write your answers in the spaces provided in this Question-Answer Book. Do not write in the margins.

(4) Unless otherwise specified, the use of HKEAA approved electronic calculators is allowed.

(5) Unless otherwise specified, all working must be clearly shown.

(6) Unless otherwise specified, numerical answers should be exact or correct to 3 significant figures.

Section A (60 marks): Working steps must be shown in answering questions in this section.

1. Prove that $4(2x - 2) = 8x - 8$ is an identity. (3 marks)

2. Determine whether $x(x - 4) + 3(x - 1) = (x + 1)(x + 2)$ is an identity. (3 marks)

3. Expand the following expressions by **using identities**.

(a) $(3 - 4a)(3 + 4a)$ (2 marks) (b) $(7 + 5k)^2$ (2 marks)

(c) $-3(2 - 5b)(2 + 5b)$ (3 marks) (d) $2(3-6x)^2$ (3 marks)

Answers written in the margins will not be marked.

4. Factorize the following expressions.

(a) $3xy - yz$ (1 mark) (b) $-4xy + 6x^2y$ (3 marks)

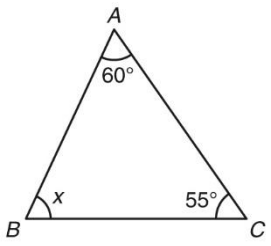
(c) $x^2 + yz - xz - yx$ (3 marks)

5. Factorize the following expressions by **using identities**.

(a) $x^2 + 2xy + y^2$ (2 marks) (b) $m^2 - 18m + 81$ (2 marks)

(c) $(x + y)^2 - 1$ (3 marks)

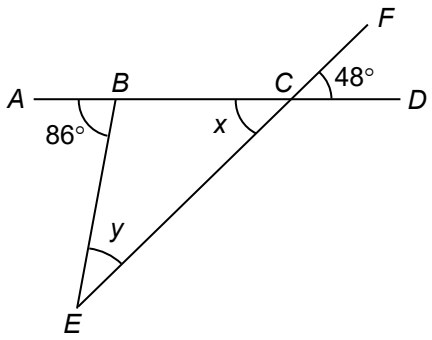
6. In the figure, find x. (2 marks)



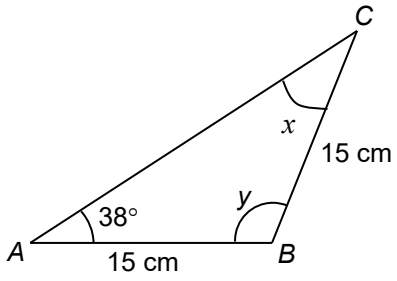
Answers written in the margins will not be marked.

Page total

7. In the figure, *ABCD* and *ECF* are straight lines. Find *x* and *y*. (4 marks)



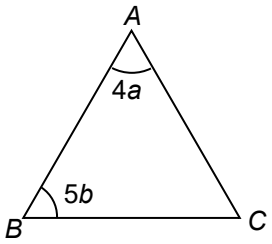
8. In the figure, find *x* and *y*. (4 marks)



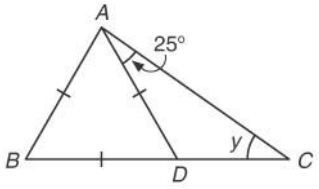
Answers written in the margins will not be marked.

Page total

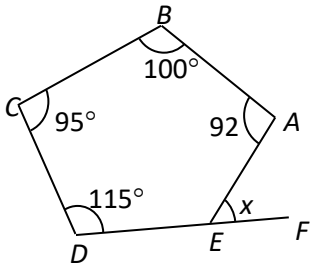
9. In the figure, $\triangle ABC$ is an equilateral triangle. Find the unknowns. (4 marks)



10. In the figure, BDC is a straight line and $\triangle ABD$ is an equilateral triangle. Find y. (5 marks)



11. In the figure, find x. (5 marks)



Page total

Answers written in the margins will not be marked.

12. Find the size of each interior angle of regular dodecagon (12-sided polygon). (3 marks)

13. Find the number of sides of a regular polygon if the size of each of its exterior angle is 45°.

(3 marks)

Answers written in the margins will not be marked.

Section B (40 marks): Working steps must be shown in answering questions in this section.

1. Factorize $(a-3b)(2a+b)-(3b-a)(b-4a)$ (3 marks)

2. (a) Factorize $x^2 - 12xy + 36y^2$ (1 mark)

(b) Hence, factorize $x^2 - 12xy + 36y^2 - x + 6y$ (4 marks)

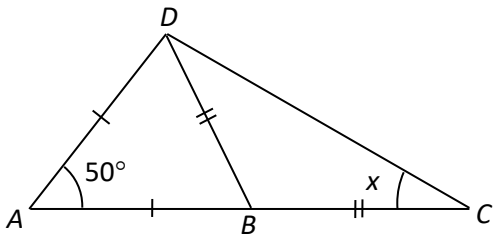
3. Factorize $3ax + 3ay - 6bx - 6by - 3az + 6bz$ (3 marks)

4. Expand $71\left(\frac{x}{4} + 6yz\right)^2$. (3 marks)

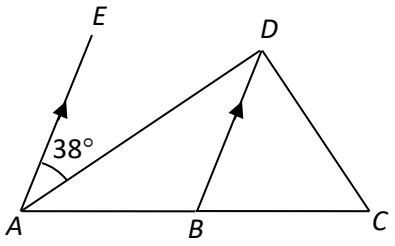
Page total

Answers written in the margins will not be marked.

5. In the figure, ABC is a straight line. $AB = AD$ and $BC = BD$. Find x. (6 marks)

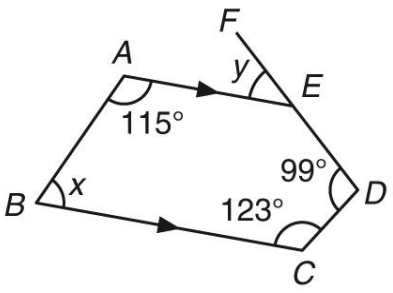


6. In the figure, ABC is a straight line. $AB = BC = BD$ and AE // BD. Find $\angle BCD$. (5 marks)



Answers written in the margins will not be marked.

7. In the figure, *DEF* is a straight line. Find *x* and *y*. (5 marks)



8. If the size of an interior angle of a regular *n*-sided polygon is greater than that of its exterior angle by 60°, find

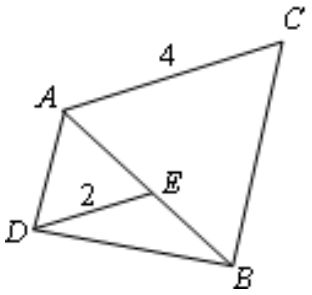
   (a) the value of *n*, (4 marks)

   (b) the size of each exterior angle. (1 marks)

Answers written in the margins will not be marked.

9. In the figure, $\triangle ABC$ and $\triangle ADE$ are equilateral triangles, $AC = 4$, $DE = 2$.

(a) Prove that $\triangle BDE$ is isosceles. (2 marks)



(b) Find $\angle BDE$ (3 marks)

Answers written in the margins will not be marked.

END OF PAPER