

2021-2022 S4 1st TERM EXAM-MATH-CP 1

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1st TERM EXAM
MATH CP
PAPER 1

2021 – 2022
S4 First Term Examination

MATHEMATICS Compulsory Part

PAPER 1

Question–Answer Book

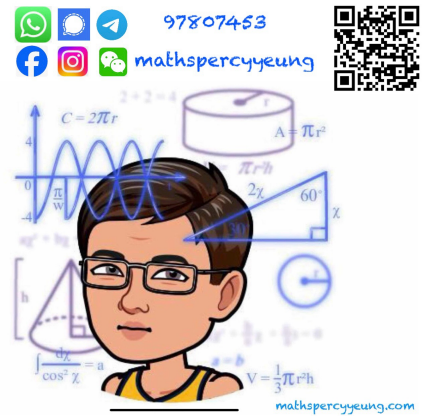
4th January, 2022

8:15 am – 9:15 am (1 hour)

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.



Section	Marks
A (1 – 3)	
A (4 – 8)	
A Total	/37
B Total	/13
TOTAL	/50

Section A(1) (16 marks)

1. Simplify $\frac{(2x^5y)^3}{(xy^4)^6}$ and express your answer with positive indices. (3 marks)

2. Make h the subject of the formula $\frac{7h-11}{h+5k} = 4$. (3 marks)

3. Simplify $\frac{4x-16}{x^2-16} \times \frac{x^2+2x-8}{6}$. (3 marks)

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4. Simplify $(\sqrt{27k} - 6\sqrt{2})(\sqrt{3k} + \sqrt{8})$. (3 marks)

5. When $2x^3 + 11x^2 + 3x - 3$ is divided by $x^2 + 3x - 1$, the quotient and the remainder are $2x + k$ and $rx + 2$ respectively. Find the values of k and r . (4 marks)

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8. In Figure 1, the straight line passing through A and B is perpendicular to the straight line passing through A and C , where C is a point lying on the y -axis.

(a) Find the equation of the straight line passing through A and B . (2 marks)

(b) Find the coordinates of C . (3 marks)

(c) Find the area of $\triangle ABC$. (2 marks)

(d) A straight line passing through A cuts the line segment BC at D such that the area of $\triangle ABD$ is 50 square units. Find $BD : DC$. (2 marks)

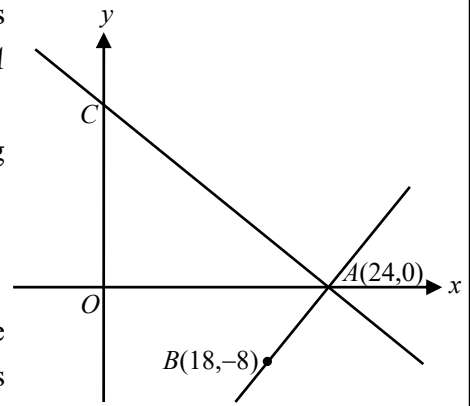


Figure 1

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Section B (13 marks)

9. The equation of the parabola Γ is $y = x^2 + 4x - k^2$, where k is a real constant.

(a) Does Γ cut the x -axis? Explain your answer. (2 marks)

(b) Let P be the vertex of Γ . Express the coordinates of P in terms of k . (2 marks)

(c) Denote the straight line $2x + y + 9 = 0$ by L . If Γ and L intersect at M and N , find the coordinates of the mid-point of MN . (3 marks)

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