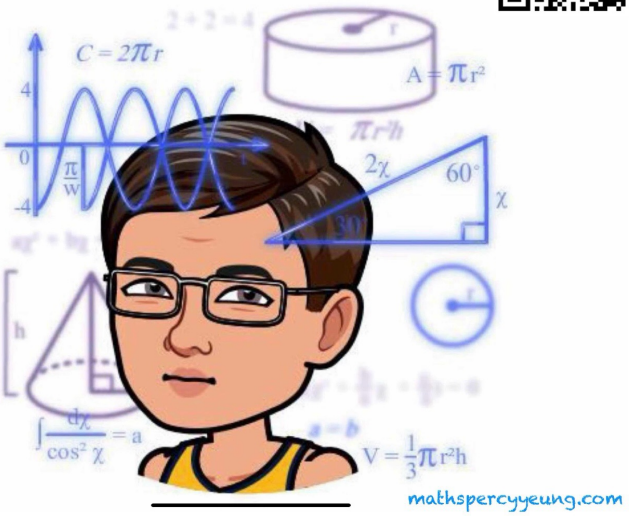


MATH CP
PAPER 1

2025 – 2026

Second Term Examination

S.4 MATHEMATICS Compulsory Part

PAPER 1

Question-Answer Book

Time allowed: 1 hours 45 minutes
Full Marks: 88

This paper must be answered in English

INSTRUCTIONS

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

(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) Graph paper and supplementary answer sheets will be supplied on request. Write your name, class and class number in the spaces provided on each sheet and fasten them with string INSIDE this book.

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

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

(7) The diagrams in this paper are not necessarily drawn to scale.

(8) Only calculators with the "**H.K.E.A. APPROVED**" or "**H.K.E.A.A. APPROVED**" label are allowed in the examination.

SECTION A(1) **(22 marks)**

1. Simplify $\frac{xy^7}{(x^{-2}y^3)^4}$ and express your answer with positive indices.

(3 marks)

2. Factorize

(a) a^2-2a-3 ,

(b) $ab^2+b^2+a^2-2a-3$.

(3 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Name:_____ S.4_____ ( )

3. Consider the formula $3(2c+5d+4)=39d$.

   (a) Make c the subject of the above formula.

   (b) If the value of d is decreased by 1, how will the value of c be changed?

(3 marks)

4. Let a, b and c be non-zero numbers such that $\frac{a}{b}=\frac{6}{7}$ and $3a=4c$. Find $\frac{b+2c}{a+2b}$

(3 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Go on to the next page

5. The marked price of a handbag is $ 560 . It is given that the marked price of the handbag is 40 % higher than the cost.

   (a) Find the cost of the handbag.

   (b) If the handbag is sold at $ 460 , find the percentage profit .

(4 marks)

6. The following table shows the number of books read by some students in a certain month.

Number of books read	6	9	12	15
Number of students	4	7	10	x

If the mean number of books read by these students is 11, find the value of x .

(2 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Name:_____ S.4_____ ( )

7. A bottle is termed *standard* if its capacity is measured as 200 mL correct to the nearest 10 mL.
   (a) Find the least possible capacity of a *standard* bottle.
   (b) Someone claims that the total capacity of 120 *standard* bottles can be measured as 23.3 L correct to the nearest 0.1 L. Do you agree? Explain your answer.

(4 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Go on to the next page

SECTION A(2) **(44 marks)**

8. Let $a > 0$ and $b > 0$. Simplify $(3a^{\frac{1}{3}}b^{-1})^3(a^{-2}\sqrt{b})^{\frac{1}{2}}$ and express the answer with positive indices.

(3 marks)

9. Simplify $\dfrac{\frac{1}{2}\log 256 + 2\log x^2 + 8\log y}{\log(2x) + 4\log\sqrt{y}}$, where $x, y > 0$.

(3 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

2025 – 2026
Second Term Examination
S.4 Mathematics Compulsory Part Paper 1

Name:_____ S.4_____ ( )

10. The straight line L: $5x - 4y - 40 = 0$ cuts the y-axis and the x-axis at A and B respectively. M is a point on L such that OM is an altitude of $\triangle OAB$.

(a) White down the coordinates of A and B. (2 marks)

(b) Find the equation of OM. (2 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

11. Let $f(x) = 3x^2 - 5x + 4$. If $f(k) = 2(k + 1)$, find the value(s) of k.

(2 marks)

12. If the difference between the two roots of the equation $x^2 - 7x + c = 0$ is 5, find

(a) the values of the two roots, (2 marks)

(b) the value of c (2 marks)

$+(c)(1)$

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Name:_____ S.4_____ ( )

13. α and β are the real roots of the quadratic equation $x^2 + (k-1)x + k + 3 = 0$, where $k > 1$.

(a) Express the value of $(\alpha - \beta)^2$ in terms of k. (3 marks)

(b) If $\dfrac{(\alpha-\beta)(\alpha^2-\beta^2)}{k-1} = -29$, find the value of k. (2 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Go on to the next page

14. The function $y = a(x - h)^2 + k$ cuts the y-axis at $A(0\ ,\ 7)$. The function intersects its axis of symmetry L at $B(3\ ,\ 16)$.

(a) Find the values of a, h and k. (3 marks)

(b) If L cuts the x-axis at C, find the area of $\triangle ABC$. (2 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Name:_____ S.4_____ ( )

15. The quadratic function $y = f(x)$ cuts the x-axis at $(-4, 0)$ and $(1, 0)$. It passes through $(-2, 6)$.

(a) Find $f(x)$. (3 marks)

(b) Find the maximum value of the function. (2 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Go on to the next page

16. Find the quotient and the remainder of $(5 - 2x^3 - x^2) \div (x^2 + 1)$.

(3 marks)

17. The polynomial $f(x) = x^3 - x^2 + (1 + a)x - 4a - 8$ is divisible by $x - 2$.

(a) Find the value of a. (2 marks)

(b) Hence, find the remainder when $f(x)$ is divided by $x + a$. (2 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Name:_____ S.4_____ ( )

18. A cup of water is cooling down under room temperature. The temperature W°C of water in the cup after t minutes can be estimated by the following formula:

$W = 24 + k \times 0.8^t$, where k is a constant.

It is given that the temperature of water in the cup is 72°C after 2 minutes.

(a) Find the value of k. (2 marks)

(b) Find the initial temperature of water in the cup. (2 marks)

(c) Robert claims that the temperature of water in the cup after 7 minutes is decreased by more than 60°C when compared with the initial temperature. Do you agree? Explain your answer. (2 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Go on to the next page

SECTION B (22 marks)

19. Let $z = (3x - 3) + (y - x)i$ be a complex number, where x and y are different real numbers. It is given that z is a purely imaginary number.

(a) Find the value of x. (2 marks)

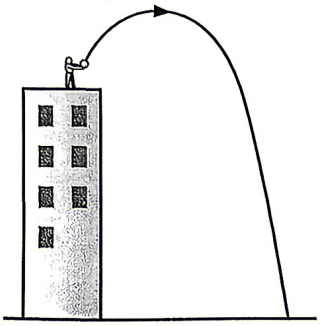
(b) If $z = \dfrac{1-i}{1+i}$, find the value of y. (3 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Name:_____ S.4_____ ( )

20. Jason shoots a water bomb by a launcher from the top of a building. After t seconds, the height of the water bomb above the ground can be represented by the function $h(t) = 20t - 10t^2 + 30$ (in m). (Note: We may neglect the height of Jason.)



(a) Find the height of the building. (2 marks)

(b) Using the method of completing the square, find the maximum height of the water bomb above the ground. (2 marks)

(c) Find the time needed for the water bomb to reach the ground. (2 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Go on to the next page

21. The coordinates of the points A and B are (24 , 0) and (0 , 8) respectively. The straight line L passes through A and B .

(a) Find the equation of L . (2 marks)

(b) It is given that P is a point on L. Let r be the x-coordinate of P .

(i) Express the coordinates of P in terms of r .

(ii) If P lies on the angle bisector of $\angle AOB$, where O is the origin, find the coordinates of P .

(4 marks)

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

2025 – 2026
Second Term Examination
S.4 Mathematics Compulsory Part Paper 1

Name:_____ S.4_____ ( )

22. Let f(x) be a cubic polynomial. When f(x) is divided by $x - 1$, the remainder is 72 . When f(x) is divided by $x + 2$, the remainder is -18 . It is given that $f(x)$ is divisible by $x^2 + 7x + 16$.

(a) Find the quotient when f(x) is divided by $x^2 + 7x + 16$. (3 marks)

(b) How many rational roots does the equation f(x) = 0 have? Explain your answer. (2 marks)

End of Paper

Answers written in the margins will not be marked.

Answers written in the margins will not be marked.

Go on to the next page