

Final Examination 2024 – 2025
S.5 Mathematics
Paper 1

Name : _____ ()
Class : S. 5 _____
Date : 4 June 2025
Time : 08:30 – 10:45 (2 hours and 15 minutes)

Past Paper Revision
for 2526 S.5

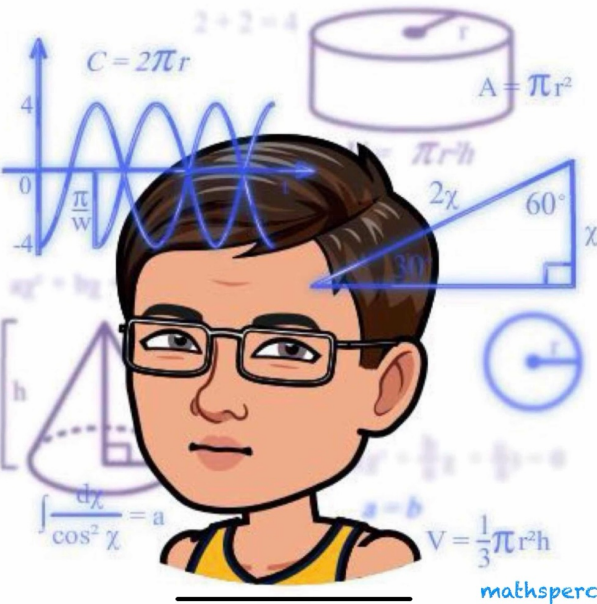
Paper	Section	Marks
1	A(1)	/ 35
	A(2)	/ 35
	B	/ 35
	PP- _____	
	Total	/ 105
2	/ 45	
Total	/ 100	

INSTRUCTIONS

1. After the announcement, write your name, class and class number.

97807453
2. This paper consists of 20 questions.

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3. Attempt ALL questions.


4. Graph paper and a ruler are provided in this paper.
5. Unless otherwise stated, give your answers in the space provided.
6. Unless otherwise stated, give your answers correct to 3 significant figures.
7. The diagrams in this paper are not drawn to scale.
8. No extra time will be given for the "Time is up" signal.
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SECTION A(1)

[35 marks]

-
1. Simplify $\frac{(a^2b^{-3})^{-2}}{a^{-3}b^5}$ and express your answers with positive indices. (3 marks)

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2. Simplify $\frac{5}{3k+2} - \frac{6}{7k-9}$. (3 marks)

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3. Make b the subject of the formula $4(a + 2b) = c(b - 7)$.

(3 marks)

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4. Factorize

(a) $4x^3 - 16x$,

(b) $xy + 2y - 4x^3 + 16x$.

(4 marks)

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5. (a) Find the range of values of x which satisfy both $\frac{5x-8}{2}-2 < x$ and $2x+4 \geq 0$.
(b) Write down the greatest integer satisfying both inequalities in (a).

(4 marks)

[illegible]

6. The number of stamps owned by Amy is 5 times that owned by Ben. If Amy gives 24 of her stamps to Ben, they will have the same number of stamps. Find the total number of stamps owned by Amy and Ben. **(4 marks)**

(4 marks)

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- [illegible]

8. In **Figure 1**, $ABCD$ is a quadrilateral with $\angle DAC = \angle DBC$. AC and BD intersect at E . It is given that $AE = BE$.

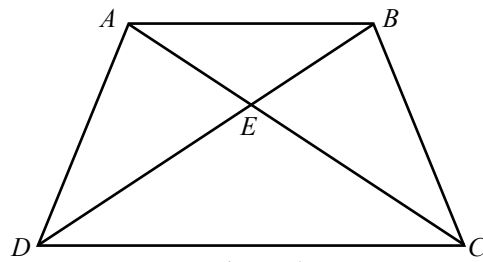


Figure 1

- (a) Prove that $\triangle ADE \cong \triangle BCE$.
- (b) Suppose that $BE = 7$ cm, $BC = 24$ cm and $EC = 25$ cm. Find the area of $\triangle BCD$.

(5 marks)

[illegible]

SECTION A(2)

[35 marks]

10. It is given that $f(x)$ is partly constant and partly varies as x . Suppose that $f(-2)=14$ and $f(7)=-22$.

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

(b) Let $g(x) = xf(x) - k$, where k is a constant. If the graph of $y = g(x)$ does not intersect with the x -axis, find the range of the values of k . **(3 marks)**

[illegible]

12. Let $f(x) = (5x + g)(hx^3 + 7x^2 + 6x + 1)$, where g and h are constants. The coefficient of x of $f(x)$ is 17.

(a) Find g .

(2 marks)

(b) It is given that $f(x)$ is divisible by $x+1$.

(i) Find h .

(ii) How many irrational roots does the equation $f(x) = 0$ have? Explain your answer.

(6 marks)

[illegible]

- 13.** The base of a solid metal right pyramid is a square with side 36 cm. The area of a lateral face of the pyramid is 540 cm^2 .

(a) Find the height of the pyramid.

(2 marks)

(b) The pyramid is divided into a right pyramid A and a frustum B by a plane which is parallel to its base. The total area of all lateral faces of B is 8 times the total area of all lateral faces of A . If B is melted and recast into 156 identical solid cubes, find the length of the side of each cube.

(4 marks)

[illegible]

- 14.** Denote the origin by O . H and K are points lying on the positive x -axis and the positive y -axis respectively. Denote the circle passing through O, H and K by C . It is given that $OH : OK = 7 : 24$ and the diameter of C is 100. Denote the centre of C by G .
- (a) Find the coordinates of G . **(3 marks)**
- (b) Write down the equation of C . **(1 mark)**
- (c) Denote the straight line passing through H and K by Γ . There is another circle S passing through H and the centre of S lies on Γ . It is given that the area of S is the same as the area of C . Denote P as the centre of S .
- (i) Find the equation of S .
- (ii) Find the ratio of the area of $\triangle O G K$ to the area of $\triangle O G P$.

(4 marks)

[illegible]

SECTION B

[35 marks]

- 15.** Let a and b be constants. Denote the graph of $y = a + \log_b x$ by H . H passes through the points $(25, -1)$ and $(625, 1)$. Express x in terms of y . **(4 marks)**

[illegible]

16. Let $G(n)$ be the n th term of a geometric sequence. It is given that $G(3) = 16$ and $G(6) = 128$.

(a) Find $G(1)$. **(2 marks)**

(b) Find the least value of k such that $\log_5 (G(1)G(2)G(3)\cdots G(k)) > 2025$. **(4 marks)**

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[illegible]

- 18.** In **Figure 2(a)**, $ABCD$ is a paper card in the shape of a trapezium with $AB \parallel DC$. It is given that $\angle ABC = 70^\circ$, $\angle BAC = 30^\circ$, $AB = 20$ cm and $DC = 25$ cm.

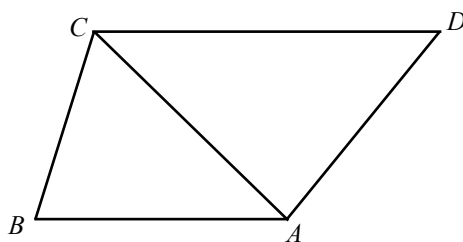


Figure 2(a)

- (a) Find the length of BC . (2 marks)
- (b) In **Figure 2(b)**, the paper card in **Figure 2(a)** is folded along AC such that the distance between B and D is 22 cm.

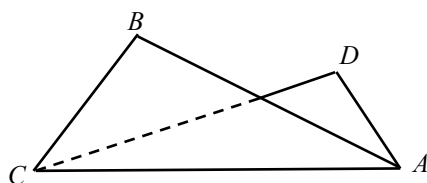


Figure 2(b)

- (i) Find $\angle BCD$.
- (ii) Someone claims that the angle between the plane ABC and plane ADC must be smaller than 48° . Do you agree? Explain your answer.

(6 marks)

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[illegible]

