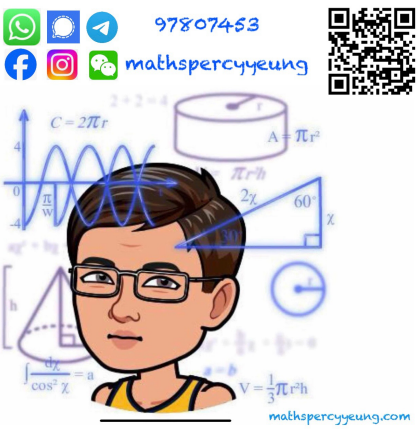
Mid-year Examination 2025 - 2026
S.5 Mathematics
Paper 2



Name : _____ ( )

Class : S. 5 _____

Date : 5th December 2025

Time : 12:00 – 13:00 (1 hour)

INSTRUCTIONS

1. Read carefully the instructions on the Answer Sheet. After the announcement of the start of the examination, you should first write your name, class and class number on this cover page. You should also insert the information required in the spaces provided on the Answer Sheet. Darken the corresponding boxes accordingly if necessary. No extra time will be given for inserting the information or darkening the boxes after the "Time is up" announcement.

2. When told to open this paper, you should check that all questions are there. Look for the words "**END OF PAPER**" after the last question.

3. All questions carry equal marks.

4. **ANSWER ALL QUESTIONS**. You are advised to use an HB pencil to mark all the answers on the Answer Sheet, so that wrong marks can be completely erased with a clean rubber. You must mark the answers clearly; otherwise you will lose marks if the answers cannot be captured.

5. You should mark only **ONE** answer for each question. If you mark more than one answer, you will receive **NO MARKS** for that question.

6. No marks will be deducted for wrong answers.

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

Section A

1. $4^{256} \times 6^{128} =$

   A. 24^{128}

   B. 24^{256}.

   C. 96^{128}.

   D. 96^{256}.

2. Factorize $a^2 + 4b^2 - 4 - 4ab$.

   A. $(a-2b+2)(a+2b-2)$

   B. $(a-2b+2)(a-2b-2)$

   C. $(a+2b-2)(a-2b-2)$

   D. $(a+2b-2)(a+2b+2)$

3. If $x(x-4)+ax+2 \equiv (x-1)(x-a)+bx$, where a and b are constants, then $b =$

   A. 1.

   B. 2.

   C. 3.

   D. 4.

4. $\dfrac{4}{n+2} - \dfrac{3}{n-5} =$

   A. $\dfrac{1}{(n+2)(n-5)}$.

   B. $\dfrac{n}{(n+2)(n-5)}$.

   C. $\dfrac{n-14}{(n+2)(n-5)}$.

   D. $\dfrac{n-26}{(n+2)(n-5)}$.

5. Let k be a constant. Solve the equation $(x-2k)^2=(k-2x)^2$.

A. $x=k$

B. $x=2k$

C. $x=-k$ or $x=k$

D. $x=-k$ or $x=3k$

6. 0.0740556905 =

A. 0.074 (correct to 2 decimal places).

B. 0.0740 (correct to 3 significant figures).

C. 0.07406 (correct to 4 decimal places).

D. 0.074056 (correct to 5 significant figures).

7. The solution of $3x-4<8-x$ or $3(5-x)>21$ is

A. $x>3$.

B. $x<3$.

C. $x>-2$.

D. $x<-2$.

8. A sum of \$33 000 is deposited at an interest rate of 6% per annum for 3 years, compounded monthly. Find the amount correct to the nearest dollar.

A. \$ 38 940

B. \$ 39 304

C. \$ 39 404

D. \$ 39 490

9. Let p(x) be a polynomial. When p(x) is divided by $x+2$, the remainder is 3. If p(x) is divisible by $x-1$, find the remainder when p(x) is divided by x^2+x-2.

A. $-x-1$

B. $-x+1$

C. $x-1$

D. $x+1$

10. Let a be a non-zero real constant. Which of the following statements about the graph of $y=(1-ax)^2-a^2$ must be true?

A. The graph opens downwards.

B. The y-intercept of the graph is $-a^2$.

C. The graph cuts the x-axis.

D. The coordinates of the vertex of the graph are $(1,-a^2)$.

11. If w varies directly as the square root of x and inversely as the cube of y, which of the following must be a constant?

A. $\dfrac{wy^3}{x^2}$

B. $\dfrac{x}{w^2y^6}$

C. $\dfrac{x^3}{w^2y^6}$

D. $\dfrac{w^2x}{y^6}$

12. Let a_n be the nth term of a sequence. If $a_4=25$, $a_6=15$ and $a_{n+2}=a_n+a_{n+1}$ for any positive integer n, then $a_1=$

A. -95.

B. -10.

C. 40.

D. 60.

13. The height and the total surface area of a solid right circular cylinder are 15 cm and 432π cm^2 respectively. If the radius of a solid sphere is equal to the base radius of the circular cylinder, then the volume of the sphere is

A. 108π cm^3.

B. 151π cm^3.

C. 972π cm^3.

D. $1\,602\pi$ cm^3.

14. If the sum of the interior angles of a regular n-sided polygon is $2\,880°$, which of the following is true?

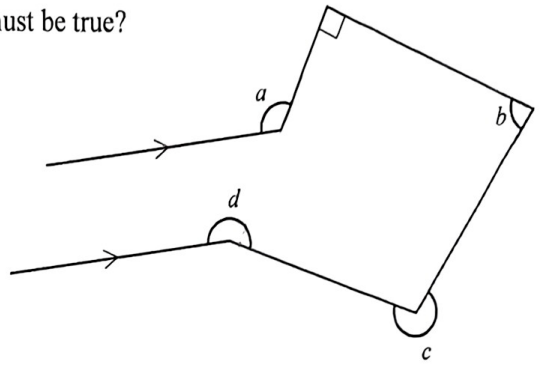
A. The value of n is 14.

B. Each exterior angle of the polygon is $20°$.

C. The number of diagonals of the polygon is 18.

D. Each interior angle of the polygon is $157.5°$.

15. According to the figure, which of the following must be true?



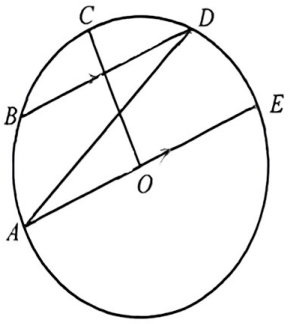
A. $a+b-c+d=90°$

B. $a-b+c-d=90°$

C. $a+b-c+d=180°$

D. $a-b+c-d=270°$

16. In the figure, O is the centre of the circle $ABCDE$. $BD \parallel AE$ and $OC \perp AE$. If $AE=10$ cm and $BD=6$ cm, find the length of AD correct to 3 significant figures.



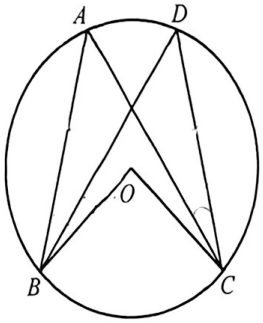
A. 7.21 cm

B. 8.94 cm

C. 9.17 cm

D. 9.54 cm

17. In the figure, O is the centre of the circle $ABCD$. If $AB=DC$, $\angle ABD=22°$ and $\angle OBD=20°$, then $\angle BOC=$



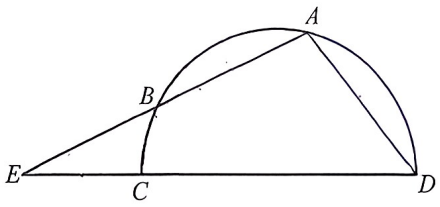
A. $96°$.

B. $116°$.

C. $124°$.

D. $138°$.

18. In the figure, $ABCD$ is a semi-circle. AB and DC are produced and meet at E. If $AB = AD$ and $\angle BAD = 112°$, then $\angle BEC =$



A. $12°$.

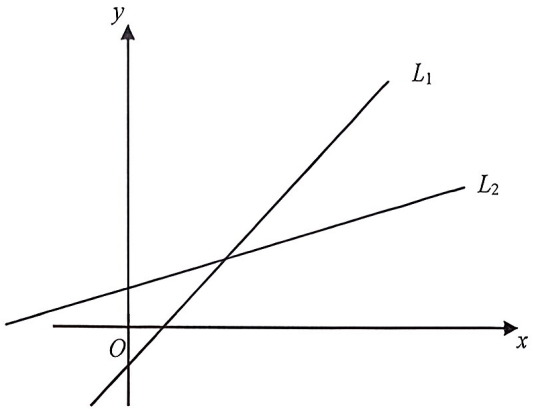
B. $18°$.

C. $22°$.

D. $34°$.

19. In the figure, the equations of the straight lines L_1 and L_2 are $ax+by=7$ and $cx+dy=7$ respectively. Which of the following are true?

I. $b<0$
II. $a>cd$
III. $ad>bc$



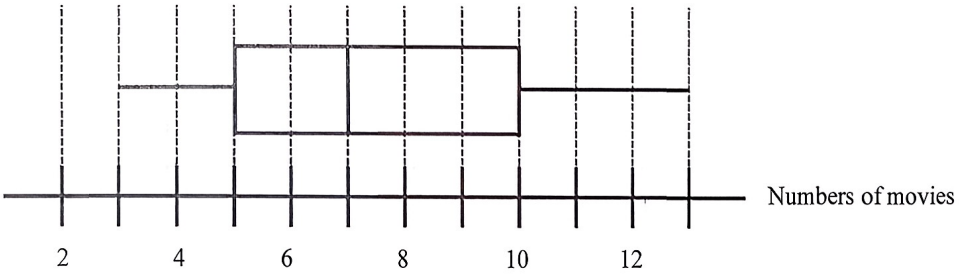
A. I and II only

B. I and III only

C. II and III only

D. I, II and III

20. The box-and-whisker diagram below shows the distribution of the numbers of movies watched by some teachers in the last summer holiday. Find the inter-quartile range of the distribution.



A. 5

B. 7

C. 8

D. 10

21. Consider the following data:

$$12 \quad 14 \quad 17 \quad 21 \quad 23 \quad 24 \quad m \quad n$$

It is given that the mean and the median of the above distribution are both 22. Which of the following statements are true?

I. $m \leq 22$
II. $n \leq 42$
III. $m+n=65$

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

Section B

22. A cafe holds a lucky draw in which a player has to pay \$10 for drawing a colour ball at random from a box. There are 40 colour balls in the box. The prize of each colour ball is listed as follows:

Colour of the ball	red	white	blue
Prize	\$50	\$15	No Prize

It is known that there are 5 red balls and 18 white balls. Find the expected value of the game.

A. \$3

B. \$8

C. \$13

D. \$15

23. $6\times8^3+2\times8^2+7\times8+6=$

A. 11010000110_2.

B. 11001011110_2.

C. 110100000110_2.

D. 110010111110_2.

24. The L.C.M. of $4x^2 - 9y^2$, $6x - 9y$ and $(2x + 3y)(4x^2 - 9y^2)$ is

A. $2x - 3y$.

B. $(2x - 3y)(2x + 3y)$.

C. $3(2x - 3y)(2x + 3y)^2$.

D. $3(2x - 3y)^3(2x + 3y)^3$.

25. How many real roots does the equation $\sqrt{4x^2 - 1} - 4x^2 + 1 = 0$ have?

A. 1

B. 2

C. 3

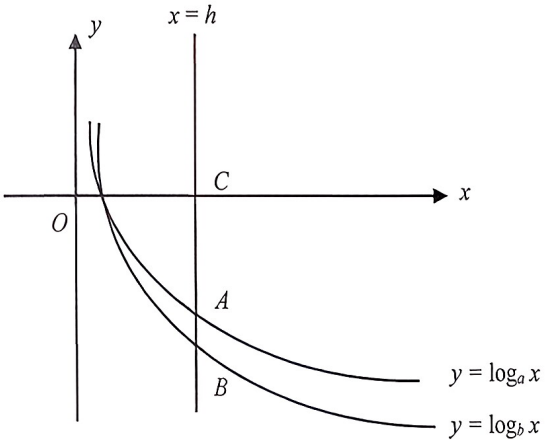
D. 4

26. The figure shows the graph of $y = \log_a x$ and the graph of $y = \log_b x$ on the same rectangular coordinate system, where a and b are positive constants. If a vertical straight line $x = h$ cuts the graph of $y = \log_a x$, the graph of $y = \log_b x$ and the x-axis at the points A, B and C respectively, which of the following must be true?

I. $b > a$

II. $\angle COA = 45°$

III. $\dfrac{AB}{AC} = \log_b \dfrac{a}{b}$



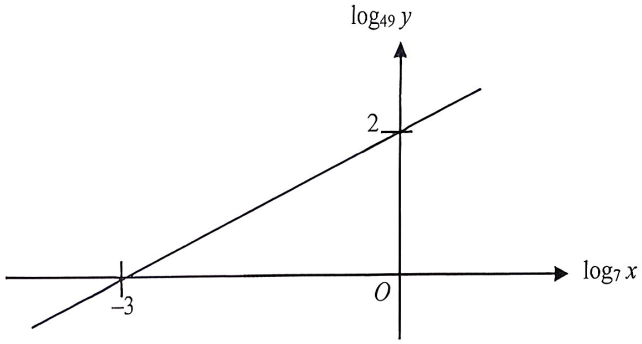
A. I and II only

B. I and III only

C. II and III only

D. I, II and III

27. The graph in the figure shows the linear relation between $\log_7 x$ and $\log_{49} y$. Which of the following must be true?



A. $x^4y^3 = 7^{12}$

B. $x^3y^4 = 7^{12}$

C. $\frac{x^4}{y^3} = 7^{12}$

D. $\frac{y^3}{x^4} = 7^{12}$

28. $i^4 + i^5 + i^6 + ... + i^{729} =$

A. 1.

B. i.

C. $1+i$.

D. $1-i$.

29. Let k be a constant. Find the range of values of k such that $x^2 - kx + 8 - k \geq 0$ for any real number x.

A. $-8 \leq k \leq 4$

B. $-4 \leq k \leq 8$

C. $k \leq -8$ or $k \geq 4$

D. $k \leq -4$ or $k \geq 8$

30. If the sum of the first n terms of a sequence is $-2n(2-n)$, which of the following is/are true?

I. 16 is a term of the sequence.
II. The sequence is an arithmetic sequence.
III. The third term of the sequence is 6.

A. I only
B. II only
C. I and III only
D. II and III only

31. Let a, b and c be positive real numbers. If a, b, c is a geometric sequence, which of the following must be true?

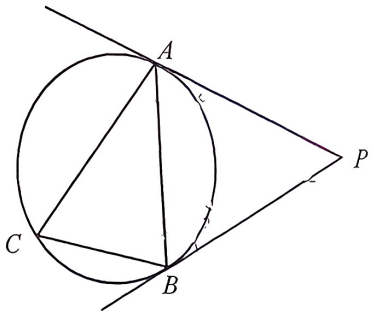
I. $\log(5a^2)$, $\log(5b^2)$, $\log(5c^2)$ is an arithmetic sequence.
II. a^b, b^b, c^b is a geometric sequence.
III. 5^a, 5^b, 5^c is a geometric sequence.

A. I and II only
B. I and III only
C. II and III only
D. I, II and III

32. Let a_n be the nth term of a geometric sequence. It is given that $a_1 = y+16$, $a_2 = 24$ and $a_3 = y-4$. If $S = a_1 + a_2 + a_3 + \cdots$ and S is a real number, find the value(s) of S.

A. 108
B. 20
C. –32 or 20
D. –6.4 or 108

33. In the figure, PA and PB are tangents to the circle ABC at A and B respectively. If $\angle APB = 52°$ and $\angle CAB = 38°$, then $\angle CBA =$



A. $26°$.

B. $48°$.

C. $64°$.

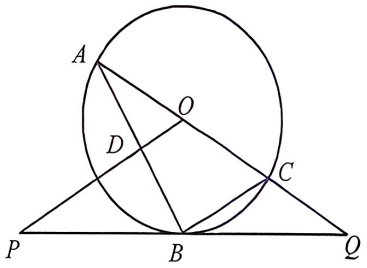
D. $78°$.

34. In the figure, PQ is the tangent to the circle ABC with centre O at B. $AOCQ$ is a straight line. OP and AB intersect at D. If $OP \parallel CB$, which of the following must be true?

I. $AD = DB$

II. B, C, O and D are concyclic.

III. $\Delta CQB \sim \Delta BQA$



A. I and II only

B. I and III only

C. II and III only

D. I, II and III

35. Let k be a positive constant. The equations of the straight lines L_1 and L_2 are $3x - 4y + 72k = 0$ and $3x + 4y - 72k = 0$ respectively. L_1 and L_2 cut the x-axis at points P and Q respectively while L_1 and L_2 meet at R. Denote the centroid and the orthocentre of ΔPQR by H and K respectively. Find the length of HK.

A. $12k$

B. $24k$

C. $26k$

D. $32k$

36. Let m_1, s_1 and r_1 be the median, the standard deviation and the range of a group of numbers $\{x_1, x_2, x_3, x_4, x_5\}$ respectively while m_2, s_2 and r_2 be the median, the standard deviation and the range of a group of numbers $\{1-3x_1, 1-3x_2, 1-3x_3, 1-3x_4, 1-3x_5\}$ respectively. Which of the following must be true?

I. $m_2 = 1 - 3m_1$

II. $r_2 = -3r_1$

III. $s_2 = -3s_1$

A. I only

B. II only

C. I and III only

D. II and III only

END OF PAPER