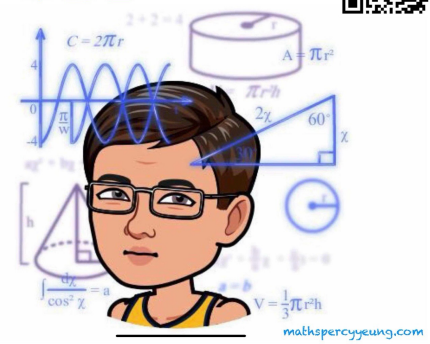
MATH CP
PAPER 2



2025 – 2026

Second Term Examination

S.4 MATHEMATICS Compulsory Part

PAPER 2

Name:_____ Full Marks: 40

S.4_____( ) Time Allowed: 1 hour 15 minutes

INSTRUCTIONS

1. Write your name, class and class number in the spaces provided on both the question paper and the Multiple-Choice Answer Sheet.
2. This paper consists of TWO sections: Section A and Section B.
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.
8. Only calculators with the "**H.K.E.A. APPROVED**" or "**H.K.E.A.A. APPROVED**" label are allowed in the examination.

There are 28 questions in Section A and 12 questions in Section B.
The diagrams in this paper are not necessarily drawn to scale.
Choose the best answer for each question.

Section A

1. $3m^2 + 7mn + 4n^2 - m - n =$
   A. $(m-n)(3m-4n+1)$.
   B. $(m-n)(3m+4n+1)$.
   C. $(m+n)(3m-4n-1)$.
   D. $(m+n)(3m+4n-1)$.

2. If $\frac{a+3b}{4a+b} = b-5$, then $a =$
   A. $\frac{4b-21}{8b-b^2}$.
   B. $\frac{4b-21}{8b+b^2}$.
   C. $\frac{8b-b^2}{4b-21}$.
   D. $\frac{8b+b^2}{4b-21}$.

3. If p and q are constants such that $x(x-p)+q \equiv (x+3)(x+q)-4$, then $p =$
   A. –5.
   B. –4.
   C. 4.
   D. 5.

4. The price of 4 footballs and 3 basketballs is \$2 550. If the prices of 3 footballs and 2 basketballs are the same, find the price of a football.
   A. \$450
   B. \$400
   C. \$350
   D. \$300

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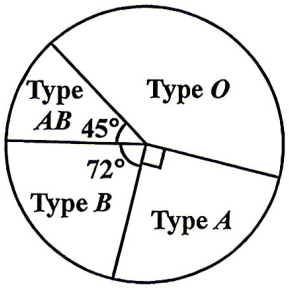
5. $\sqrt{2016}$ =
   A. 44.84 (correct to to 2 decimal places).
   B. 44.9 (correct to 3 decimal places).
   C. 44.8 (correct to 3 significant figures).
   D. 44.900 (correct to 5 significant figures).

6. The length and the width of a rectangle are measured as 15 cm and 12 cm correct to the nearest cm respectively. Let x cm^2 be the actual area of the rectangle. Find the range of values of x.
   A. $166.75 < x \leq 193.75$
   B. $166.75 \leq x < 193.75$
   C. $179.5 < x \leq 180.5$
   D. $179.5 \leq x < 180.5$

7. The pie chart shows the distribution of the types of blood collected from donation on a certain day at a blood centre. 40 L of type B blood is collected on that day. Find the amount of type O blood collected on that day.

Distribution of the types of blood collected from donation on a certain day



   A. 85 L
   B. 136 L
   C. 153 L
   D. 200 L

8. If the number of students is decreased by 25% after 1 year and then decreased by further 20% in the next year, find the percentage change in the number of students.
   A. –40%
   B. –45%
   C. –55%
   D. –60%

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9. $4^{n+2}3^{2n+4} =$

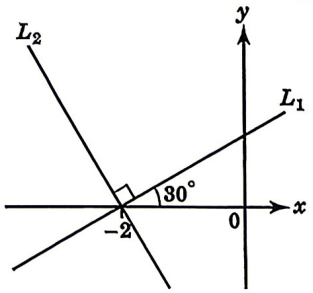
A. 6^{2n+4}.

B. 6^{4n+8}.

C. 12^{2n+4}.

D. 12^{3n+6}.

10. In the figure, the straight lines L_1 and L_2 have the same x-intercept and $L_1 \perp L_2$. The inclination of L_1 is 30°. Find the equation of L_2.



A. $x+\sqrt{3}y+2=0$

B. $x-\sqrt{3}y+2=0$

C. $\sqrt{3}x+y+2\sqrt{3}=0$

D. $\sqrt{3}x-y+2\sqrt{3}=0$

11. Find the constant k such that the straight lines $6x-8y=7k$ and $kx+12y=5$ do not intersect with each other.

A. −16

B. −9

C. 9

D. 16

12. The equation of the straight line L_1 is $3x + 4y - 48 = 0$. The straight line L_2 is perpendicular to L_1 and intersects L_1 at a point lying on the y-axis. Find the area of the region bounded by L_1, L_2 and the x-axis.

A. 96

B. 108

C. 150

D. 192

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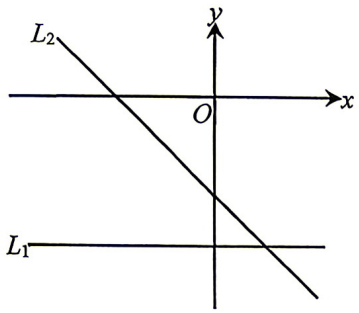
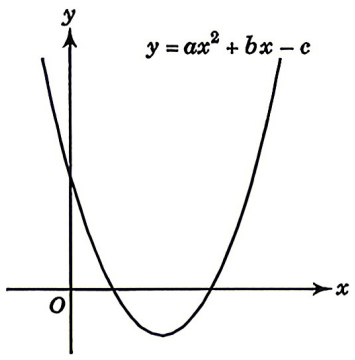
13. In the figure, the equations of the straight lines L_1 and L_2 are $ay = -2$ and $bx - cy = 2$ respectively. Which of the following are true?



I. $a > 0$
II. $a < c$
III. $b > 0$

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

14. The figure shows the graph of $y = ax^2 + bx - c$, where $a \neq 0$. Which of the following is true?



A. $b^2 - 4ac > 0$
B. $b^2 - 4ac < 0$
C. $b^2 + 4ac > 0$
D. $b^2 + 4ac < 0$

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15. It is given that y is a function of x and $y = \dfrac{1}{\sqrt{x-7}}$. Which of the following is the domain of the function?

A. All real numbers

B. All real numbers greater than 7

C. All real numbers greater than or equal to 7

D. All real numbers except 7

16. Let $f(x) = x^2 - x - 3$ and $g(x) = 1 - x$. If $f(k) = 3g(k+1)$, then $k =$

A. -3 or -1.

B. -1 or 3.

C. -3 or 1.

D. 3 or 1.

17. Which of the following statements about the graph of the quadratic function $y = 16 - 4(x-1)^2$ is not true?

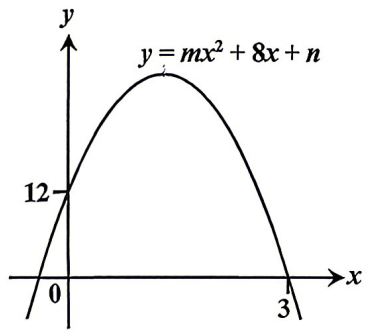
A. The equation of the axis of symmetry is $x = 1$.

B. The x-intercepts are -3 and 1.

C. The y-coordinate of the vertex is 16.

D. The y-intercept is 12.

18. The figure shows the graph of $y = mx^2 + 8x + n$, where m and n are constants. The equation of the axis of symmetry of the graph is



A. $x = -1$.

B. $x = 1$.

C. $x = 2$.

D. $y = 16$.

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19. Let $f(x)=3x^2+18mx+22m^2$, where m is a real constant. Which of the following statements about the graph of $y=-f(3x)$ must be true?

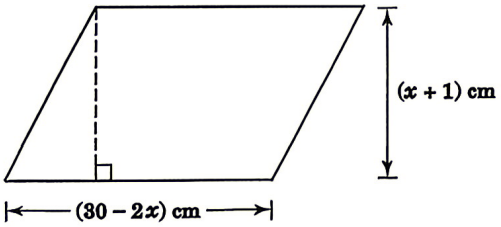
I. The x-coordinate of the vertex of the graph is m.
II. The y-coordinate of the vertex of the graph is $5m^2$
III. The equation of the axis of symmetry of the graph is $x+m=0$.

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

20. Let k be a constant. Find the range of values of k such that the quadratic equation $x^2-8x-k=1$ has no real roots.

A. $k>16$
B. $k>17$
C. $k<-17$
D. $k<-16$

21. The maximum area of the parallelogram in the figure is



A. 128 cm^2.
B. 110 cm^2.
C. 62 cm^2.
D. 30 cm^2.

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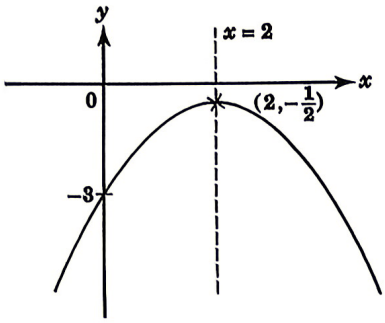
22. The equation of the parabola shown in the figure is



A $y=-\frac{5}{8}(x+2)^2+\frac{1}{2}$.

B $y=-\frac{5}{8}(x+2)^2-\frac{1}{2}$.

C. $y=-\frac{5}{8}(x-2)^2+\frac{1}{2}$.

D. $y=-\frac{5}{8}(x-2)^2-\frac{1}{2}$.

23. When $2x^3+3x^2-5x+7$ is divided by $x+3$, the quotient is

A. $2x^2-4x+3$.

B. $2x^2+4x-3$.

C. $2x^2+3x-4$.

D. $2x^2-3x+4$.

24. 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 $(x+1)(x+2)$.

A. $-3x-3$

B. $-3x-6$

C. $3x+3$

D. $3x+6$

25. Let $f(x)=x^2+px+q$, where p and q are constants. If $f(x)$ is divisible by $x-4p$, find the remainder when $f(x)$ is divided by $x+4p$.

A. $-4p^2$

B. $-8p^2$

C. 0

D. $4p^2$

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26. Let $f(x) = x^3 + ax^2 + 6ax + 16$, where a is a constant. If $x + 2$ is a factor of $f(x)$, then $f(-1) =$
    A. -24.
    B. -10.
    C. 10.
    D. 24.

27. Let $a > 1$ and $0 < b < 1$. The coordinates of the point of intersection of the graphs of $y = a^x$ and $y = b^x$ are
    A. $(1 , 0)$.
    B. $(0 , 1)$.
    C. (a , b).
    D. (b , a).

28. Let $x > 0$. Simplify $\dfrac{(\sqrt[3]{x^2})^2 \cdot \sqrt{x}}{\sqrt[3]{x^{-2}}}$.
    A. $x^{\frac{11}{9}}$
    B. $x^{\frac{3}{8}}$
    C. $x^{\frac{5}{2}}$
    D. $x^{-\frac{3}{2}}$

SECTION B

29. If a and b are distinct real numbers, and $\begin{cases} a^2 + 6a + 3 = 0 \\ b^2 + 6b + 3 = 0 \end{cases}$, find the value of $a^2 + b^2$.
    A. 25
    B. 30
    C. 35
    D. 40

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30. Which of the following must be true?

I. All natural numbers are rational numbers.

II. π is a complex number.

III. The product of two irrational numbers must be irrational.

A. I and II only

B. I and III only

C. II and III only

D. I, II and III

31. If k and $\frac{20}{3+i}-2ki$ are real numbers, then $k=$

A. -6.

B. -1.

C. 1.

D. 6.

32. Let $z=2k-4i^{10}-6ki^{13}-8i^{21}-10ki^{27}$, where k is a real number. If the real part and the imaginary part of z are equal, then the imaginary part of z is

A. -16.

B. -6.

C. 6.

D. 16.

33. If one of the roots of the quadratic equation $2x^2+px-54=0$ is the square of the other root, find the value of p.

A. -12

B. -3

C. 3

D. 24

34. Let n be a positive integer. Find the remainder when $x^{2(n+1)}+kx-2k$ is divided by $x+1$.

A. $-1-3k$

B. $-1-k$

C. $1-3k$

D. $1-k$

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35. If $\frac{27^x \cdot 3^{-y}}{9^x} = 1$, then $x : y =$

A. $1 : 2$.
B. $2 : 1$.
C. $3 : 2$.
D. $1 : 1$.

36. If $y = z + 9 \log x$, then $x =$

A. $10^{\frac{y-z}{9}}$.
B. $10^{\frac{z-y}{9}}$.
C. $\frac{10^{y-z}}{9}$.
D. 9^{y-z}.

37. $\frac{4\log\alpha + 7\log\sqrt[3]{\alpha}}{4\log\alpha - 7\log\sqrt[3]{\alpha}} =$

A. $\frac{\alpha^4 + \alpha^{\frac{7}{3}}}{\alpha^4 - \alpha^{\frac{7}{3}}}$.
B. $\frac{19}{5}$.
C. $\frac{19}{5}\log\alpha$.
D. $\alpha^{\frac{19}{5}}$.

38. If $\log 3 = m$ and $\log 6 = n$, then $\log 16 =$

A. $2 - n$.
B. $2(1 - m)$.
C. $4(m - n)$.
D. $4(n - m)$.

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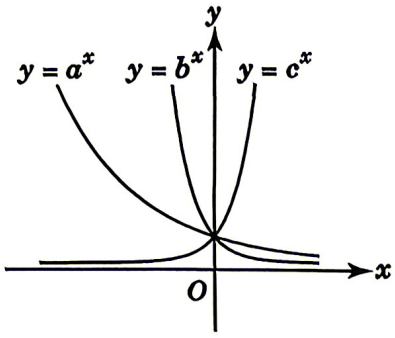
39. The figure shows the graph of $y = a^x$, the graph of $y = b^x$ and the graph of $y = c^x$, where a, b and c are positive constants. Which of the following is/are true?



I. $a < 0$

II. $c > 1$

III. $ab < 1$

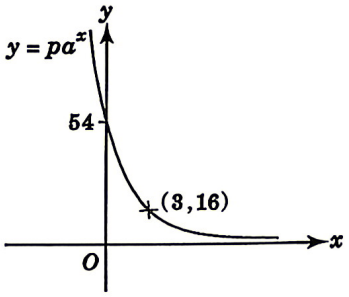
A. II only

B. III only

C. II and III only

D. I, II and III

40. The figure shows the graph of $y = pa^x$, where p and a are constants. The graph passes through $(3\ ,\ 16)$ and its y-intercept is 54. Find the value of a.



A. $\frac{1}{18}$

B. $\frac{3}{16}$

C. $\frac{8}{27}$

D. $\frac{2}{3}$

End of Paper