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Education Bureau
Territory-wide System Assessment 2025
Secondary 3 Mathematics
QUESTION BOOKLET

INSTRUCTIONS

1. There are 47 questions in this paper.
2. Time allowed is 65 minutes.
3. Answer ALL questions in the separate ANSWER BOOKLET.
4. The use of HKEAA approved calculators is permitted.
5. Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.
6. Rough work should be done on the rough work sheet provided.
7. The diagrams in this paper are not necessarily drawn to scale.

SECTION A: Choose the best answer for each question.
You should mark all your answers in the ANSWER BOOKLET.

1. $3^4 =$

- A. 34 .
- B. 3×4 .
- C. $4 \times 4 \times 4$.
- D. $3 \times 3 \times 3 \times 3$.

2. Round off 2.035 74 to 2 decimal places.

- A. 2.0
- B. 2.03
- C. 2.04
- D. 2.036

3. $\sqrt{4\,096} =$

- A. 4 .
- B. 16 .
- C. 64 .
- D. 2 048 .

4. The monthly salary of Charles is \$ x and his monthly living expenses are \$8 000 . He deposits half of the remaining amount into the bank. Find the amount he deposits each month.

A. $\$ \left(\frac{x - 8\,000}{2} \right)$

B. $\$ \left(\frac{x + 8\,000}{2} \right)$

C. $\$ \left(\frac{x}{2} - 8\,000 \right)$

D. $\$ \left(\frac{x}{2} + 8\,000 \right)$

5. Which of the following is the solution of $6x - 5 = 0$?

A. $x = \frac{5}{6}$

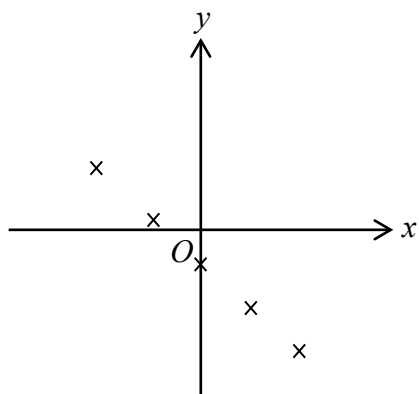
B. $x = \frac{6}{5}$

C. $x = -\frac{5}{6}$

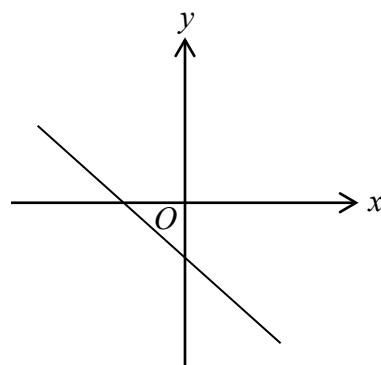
D. $x = -\frac{6}{5}$

6. Which of the following may represent the graph of the equation $2x + 3y + 8 = 0$?

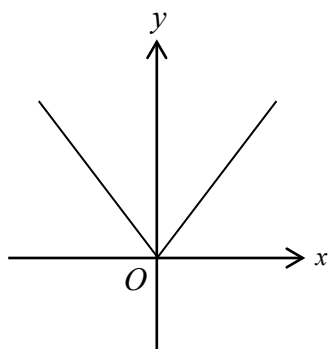
A.



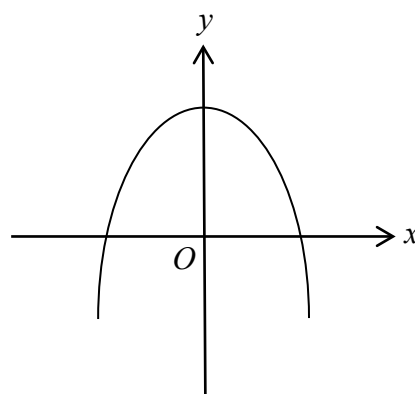
B.



C.



D.



7. $1.35 \times 10^5 =$

A. 135 000 .

B. 13 500 000 .

C. 0.000 135 .

D. 0.000 013 5 .

8. Which of the following is **NOT** a polynomial ?

A. $5x - 3y$

B. $5xy - 3$

C. $\frac{x}{5} - \frac{y}{3}$

D. $5x - \frac{3}{y}$

9. John bought a laptop from an electrical appliance shop. The marked price of the laptop was \$ m , but this price was reduced by \$450 for selling. John paid by credit card in 6 installments. Each installment was at most \$2 500 . Which of the following inequalities can be used to find the range of the values of m ?

A. $6(m - 450) < 2\,500$

B. $6(m - 450) \leq 2\,500$

C. $m - 450 < 2\,500 \times 6$

D. $m - 450 \leq 2\,500 \times 6$

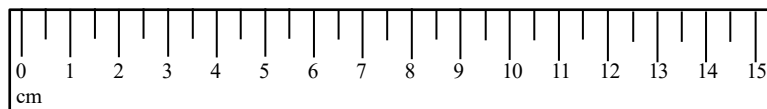
10. Kelvin uses the ruler shown in the figure to measure the length of a pencil and the result is 12.5 cm . Find the percentage error of the measured value.

A. 1.67%

B. 2%

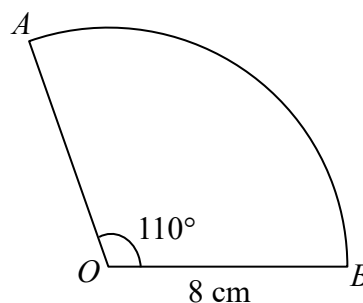
C. 4%

D. 83.3%

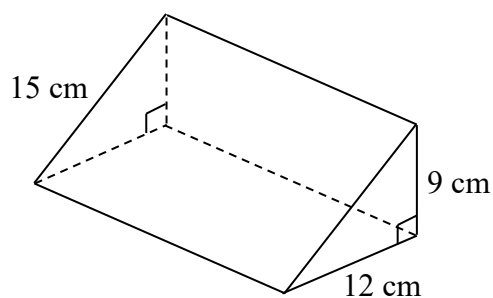


11. In the figure, the radius of sector OAB is 8 cm and $\angle AOB = 110^\circ$. Find the area of the sector.

- A. $\pi(8) \times \frac{110^\circ}{360^\circ} \text{ cm}^2$
 B. $\pi(8)^2 \times \frac{110^\circ}{360^\circ} \text{ cm}^2$
 C. $2\pi(8) \times \frac{110^\circ}{360^\circ} \text{ cm}^2$
 D. $2\pi(8)^2 \times \frac{110^\circ}{360^\circ} \text{ cm}^2$



12.

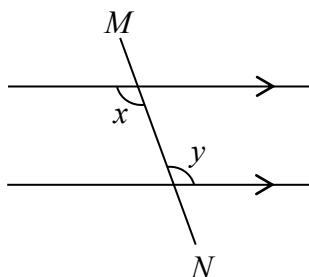


The figure shows a solid right prism. Its base is a right-angled triangle and its total surface area is 828 cm^2 . Find the height of the prism.

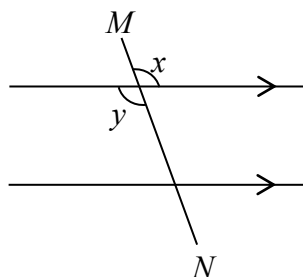
- A. 15.3 cm
 B. 20 cm
 C. 21.5 cm
 D. 23 cm

13. In each of the following figures, MN is a straight line. Which figure shows that x and y are a pair of corresponding angles ?

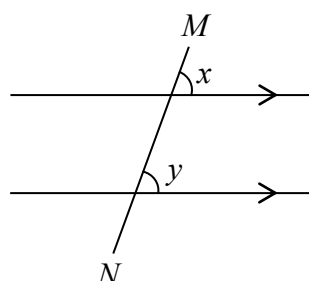
A.



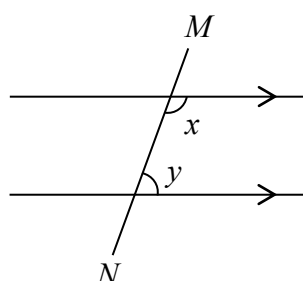
B.



C.



D.

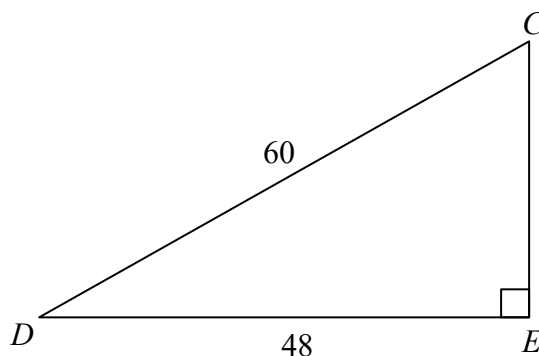


14. Which of the following **MUST** be a regular polygon ?

- A. Equiangular hexagon
- B. Right-angled triangle
- C. Trapezium
- D. Square

15. In the figure, $\triangle CDE$ is a right-angled triangle, $CD = 60$ and $DE = 48$. Find CE .

- A. $60^2 + 48^2$
- B. $60^2 - 48^2$
- C. $\sqrt{60^2 + 48^2}$
- D. $\sqrt{60^2 - 48^2}$



16. $P(2, 10)$ and $Q(-8, 0)$ are two points in the rectangular coordinate plane.

The coordinates of the mid-point of PQ are

- A. $(-6, 10)$.
- B. $(-3, 5)$.
- C. $(5, 5)$.
- D. $(10, 10)$.

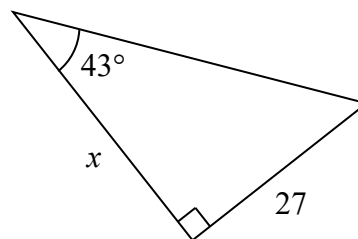
17. It is given that L_1 and L_2 are straight lines. The slope of L_1 is $-\frac{7}{12}$ and $L_1 \perp L_2$.

The slope of L_2 is

- A. $\frac{12}{7}$.
- B. $\frac{7}{12}$.
- C. $-\frac{12}{7}$.
- D. $-\frac{7}{12}$.

18. Referring to the figure, find x correct to 3 significant figures.

- A. 25.2
- B. 29.0
- C. 36.9
- D. 39.6



19. The table below shows the monthly average temperatures recorded in Hong Kong during the first half of 2024 .

Month	January	February	March	April	May	June
Temperature ($^\circ\text{C}$)	17.9	19.4	21.1	26.4	26.0	28.8

Which of the following is the most suitable statistical chart for presenting the data above ?

- A. Frequency polygon
- B. Pie chart
- C. Broken line graph
- D. Stem-and-leaf diagram

20. The following table shows the amount of different fruits in a supermarket.

Fruit	Apple	Orange	Pear
Amount	120	160	170

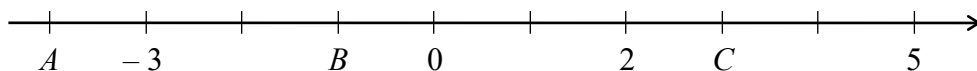
According to the table above, find the relative frequency of pear in the supermarket.

- A. $\frac{4}{15}$
- B. $\frac{16}{45}$
- C. $\frac{17}{45}$
- D. $\frac{28}{45}$

SECTION B: Write ALL the answers in the ANSWER BOOKLET.
Working need not be shown.

21. Calculate $40 \times [28 - (21 + 14 \div 7)]$.

22. Write down the numbers represented by A , B and C shown on the number line below.



23. Last year, 172 applicants from a secondary school applied for scholarships. The number of applicants increased by 43 this year. Find the percentage increase in the number of scholarship applicants for the secondary school this year.

24. In each of the following situations, determine whether the relationship between x and y is a direct proportion or an inverse proportion.

- (i) A total expense \$890 of a barbecue event is shared by x participants equally.
Each participant pays \$ y .
- (ii) The hourly parking fee at a car park is \$25 . Peter parked his car for x hours and paid a total of \$ y .

25. A department store has 180 basketballs, 210 footballs and 150 volleyballs.
Find the ratio of the number of basketballs to that of footballs to that of volleyballs.

26. Use scientific notation to represent 0.000 56 .

27. Expand $(x + 1)(2x - 3)$.

28. Factorise $3x^2 + 13x - 10$.

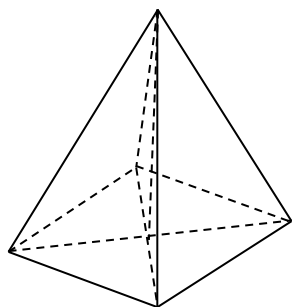
29. Factorise $49x^2 - 1$.

30. Consider the formula $h = \frac{b-a}{ak}$. If $a = 2$, $b = 5$ and $k = 9$, find the value of h .

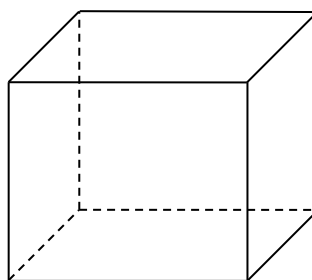
31. Solve the inequality $-4x + 5 \leq 25$.

32. The figure shows Solids A , B and C . Which of the following solids **CANNOT** represent a right prism? (May be more than one answer)

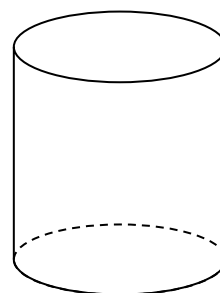
Solid A



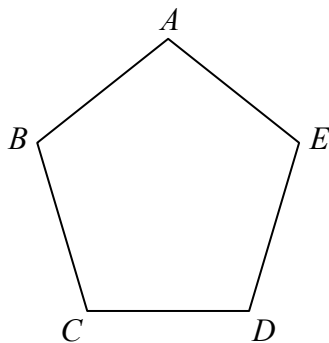
Solid B



Solid C

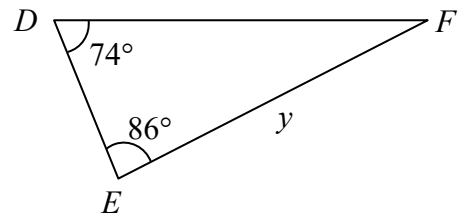
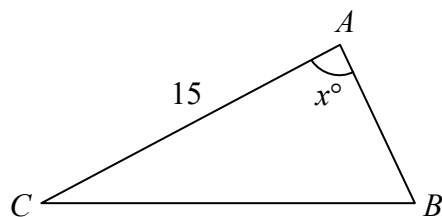


33. Use the given letters to represent the pentagon shown in the figure.

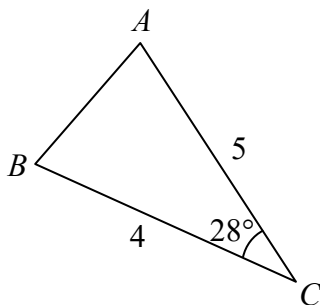


34. In the figure, $\triangle ABC \cong \triangle EDF$. Find

- (a) the value of x ,
- (b) the value of y .

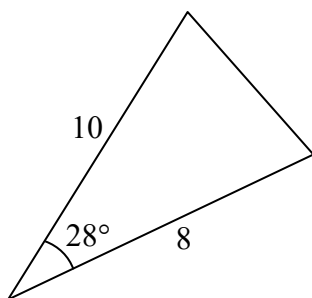


35.

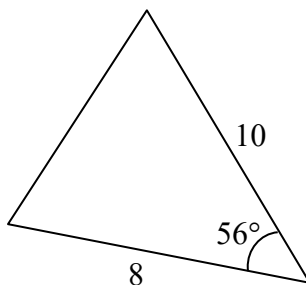


Which one of the following triangles **MUST** be similar to $\triangle ABC$ above?

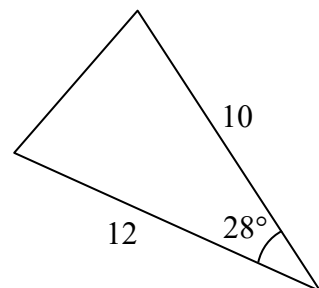
Triangle F



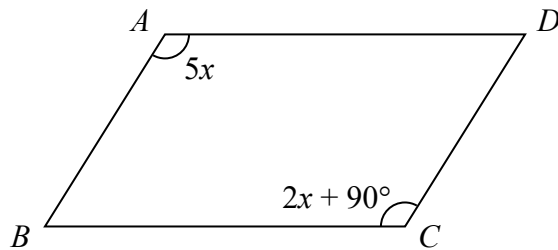
Triangle G



Triangle H



36. In the figure, $ABCD$ is a parallelogram. $\angle BAD = 5x$ and $\angle BCD = 2x + 90^\circ$. Find x .



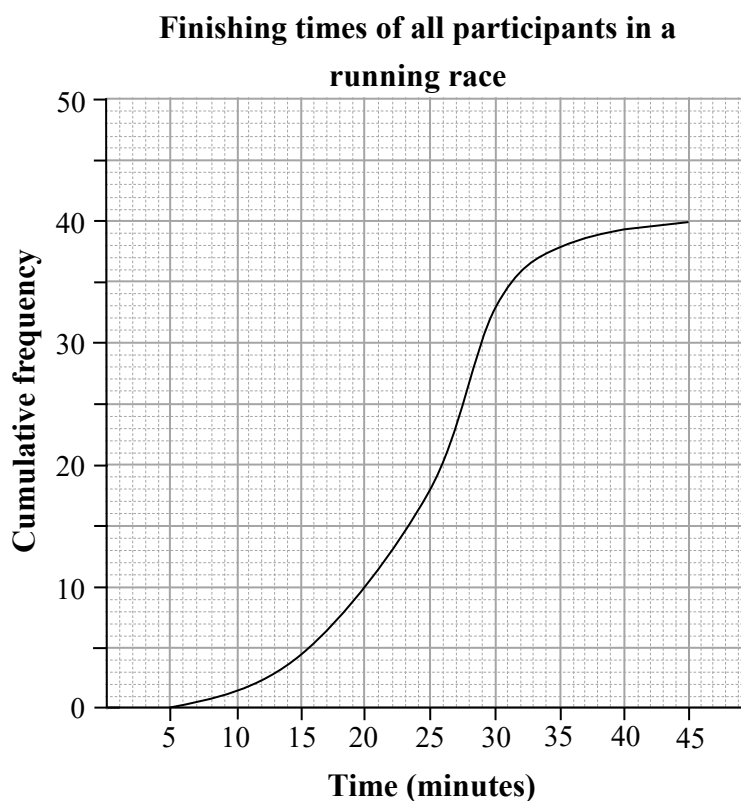
37. The stem-and-leaf diagram below shows the sale of hamburgers at each branch of a fast-food chain yesterday.

The sale of hamburgers at each branch yesterday						
Stem (10)	Leaf (1)					
5	2	3	3			
6	0	0	0	1	5	7
7	0	0	2	6		
8	0	8				
9	1	3	5			

According to the above stem-and-leaf diagram, answer the following questions.

- How many branches does the fast-food chain have ?
- How many hamburgers did the highest-selling branch of the fast-food chain sell ?
- Find the mode of the sale of hamburgers at each branch of the fast-food chain yesterday.

38. The cumulative frequency curve below shows the distribution of finishing times of all participants in a running race held by an organisation.



According to the above diagram, answer the following questions.

- How many participants were there in the race ?
 - If the finishing time of a participant is less than 30 minutes, the organisation will award the participant a medal. How many participants got a medal in the race ?
39. The following table shows the weight of each subject in the first term examination and the scores of Johnson in these subjects.

Subject	Chinese Language	English Language	Mathematics	Elective 1	Elective 2
Score	50	60	80	70	70
Weight	4	4	3	2	2

Find the weighted mean score of Johnson.

SECTION C: All working must be clearly shown.

Write the mathematical expressions, answers and statements/conclusions in the spaces provided in the ANSWER BOOKLET.

40. Daniel deposits \$54 000 in a bank at a **simple interest rate** of 4% p.a.
Find the amount he will receive after 5 years.

41. Complete the table for the equation $2x + 3y - 3 = 0$ in the **ANSWER BOOKLET**.

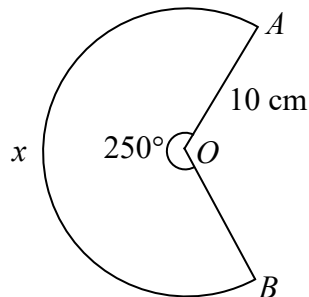
x	-3	0	3
y		1	

According to the table, plot the graph of this equation on the rectangular coordinate plane given in the **ANSWER BOOKLET**.

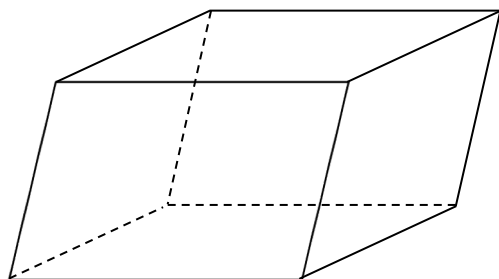
42. (a) Simplify $x^5 \cdot x^{-2}$ and express the answer with a positive index.

- (b) Simplify $x^5(x^{-1}y)^2$ and express the answer with positive indices.

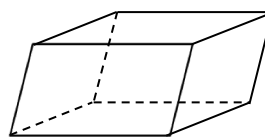
43. In the figure, the radius of sector OAB is 10 cm and reflex $\angle AOB = 250^\circ$.
Let x be the arc length of the sector. Find x correct to 3 significant figures.



44. In the figure, Solid A is similar to Solid B . The height of Solid A is 2 times that of Solid B . If the total surface area of Solid A is $3\,600\text{ cm}^2$, find the total surface area of Solid B .

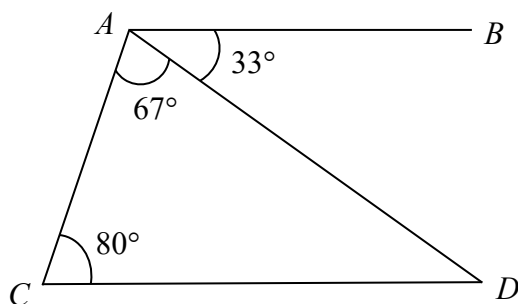


Solid A



Solid B

45. In the figure, $\angle BAD = 33^\circ$, $\angle CAD = 67^\circ$ and $\angle ACD = 80^\circ$. Prove that $AB \parallel CD$.



46. The following frequency distribution table shows the distribution of the waiting time of 40 tourists to take a cable car at a theme park.

Waiting time (minutes)	1 – 15	16 – 30	31 – 45	46 – 60	61 – 75	76 – 90	91 – 105
Frequency	3	4	5	6	10	7	5

- (a) According to the above table, complete the cumulative frequency distribution table in the **ANSWER BOOKLET**.
- (b) Construct a cumulative frequency polygon in the **ANSWER BOOKLET** to represent the above data.

47. The following shows the prices of the 8 gifts in a class lucky draw event.

\$5 \$9 \$12 \$20 \$40 \$100 \$100 \$100

The chairperson of the class committee claimed, “Since the mode of the prices of the gifts is \$100, over half of the gifts cost \$100 . ”

Do you agree with the chairperson’s claim ? Explain your answer.

END OF PAPER

Do not write on this page.
Answers written on this page will not be marked.

