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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. Find the greatest common divisor (gcd) of 3×5^2 and $3^2 \times 5 \times 7^2$.

A. $3^3 \times 5^3 \times 7^2$

B. $3^2 \times 5^2 \times 7^2$

C. $3 \times 5 \times 7^2$

D. 3×5

2. Which of the following is an irrational number ?

A. 3.14

B. $\sqrt{6}$

C. $0.\dot{3}\dot{4}$

D. $\frac{22}{7}$

3. In a student council president election at a secondary school, John and May are the only two candidates. There are 550 votes for them. John received 250 votes. Find the ratio of the number of votes for John to that for May in this election.

A. 5 : 6

B. 5 : 11

C. 5 : 16

D. 6 : 5

4. $a + a - a \times b =$

A. a .

B. ab .

C. $a + b$.

D. $2a - ab$.

5. Eric has x candies, Betty has 22 less than him. If Eric gives 29 candies to Betty, Betty will have 3 times the number of candies that Eric will have. Which of the following equations can be used to find the value of x ?

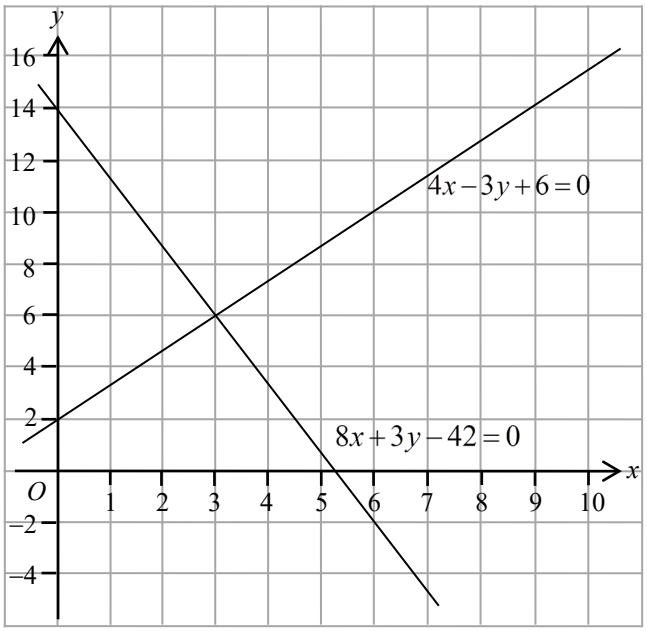
A. $3(x - 29) = x - 22$

B. $x - 29 = 3(x - 22)$

C. $3(x - 29) = x - 22 + 29$

D. $x - 29 = 3(x - 22 + 29)$

6. The figure below shows the graphs of $4x - 3y + 6 = 0$ and $8x + 3y - 42 = 0$.



According to the given graphs, solve the simultaneous equations $\begin{cases} 4x - 3y + 6 = 0 \\ 8x + 3y - 42 = 0 \end{cases}$ graphically.

A. (6, 3)

B. (0, 2)

C. (0, 14)

D. (3, 6)

7. $3^{-4} =$

A. -81 .

B. -12 .

C. $\frac{1}{81}$.

D. $\frac{1}{12}$.

8. Which of the following polynomials is in ascending order of powers of y ?

A. $6 - 4y^2 + 5y$

B. $6 + 5y - 4y^2$

C. $-4y^2 + 6 + 5y$

D. $-4y^2 + 5y + 6$

9. Which of the following is an identity ?

A. $\frac{x-4}{2} = x - 2$

B. $(x-4)^2 = x^2 - 16$

C. $-2(x-4) = -2x + 8$

D. $x - 4 = 0$

10. If $x > -7$, which of the following **CANNOT** be the value of x ?

A. -8

B. -5

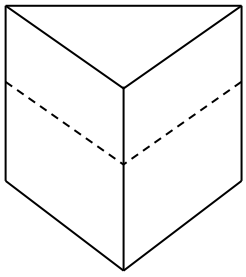
C. 0

D. 6

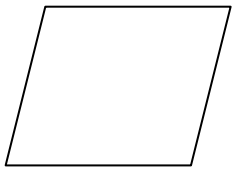
11. The length of a student card is measured as 9 cm (correct to the nearest cm). Which of the following are the lower limit and upper limit of the actual length of the student card ?

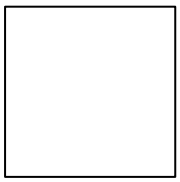
	Lower limit	Upper limit
A.	8 cm	10 cm
B.	8.5 cm	9.5 cm
C.	8.9 cm	9.1 cm
D.	8.95 cm	9.05 cm

12. A right prism is placed horizontally as shown. Isabella cuts along the dotted line to obtain a section parallel to the base.

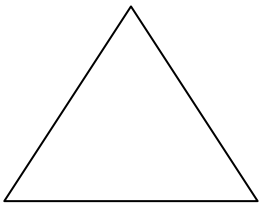


Which of the following diagrams can be the section ?

A. 

B. 

C. 

D. 

13. The base of a solid pyramid is a square of side 12 cm and its height is 25 cm .
Find the volume of the pyramid.

A. $(12)(25)^2$ cm^3

B. $(12)^2(25)$ cm^3

C. $\frac{1}{3}(12)(25)^2$ cm^3

D. $\frac{1}{3}(12)^2(25)$ cm^3

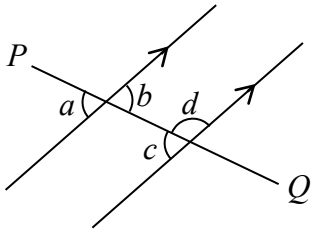
14. In the figure, PQ is a straight line. Which of the following is a pair of alternate interior angles ?

A. a and c

B. a and d

C. b and c

D. b and d



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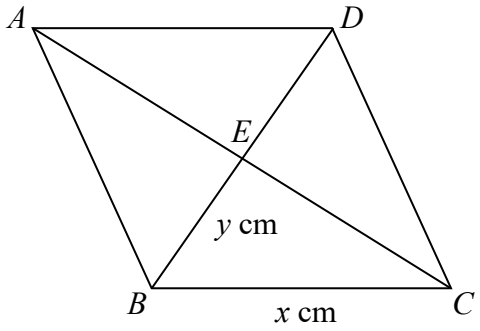
15. In the figure, $ABCD$ is a parallelogram. AC and BD intersect at E.
$AB = 24$ cm , $AD = 23$ cm , $AE = 18$ cm and $DE = 8$ cm .
If $BC = x$ cm and $BE = y$ cm , find the values of x and y .

A. $x = 23$, $y = 8$

B. $x = 23$, $y = 18$

C. $x = 24$, $y = 8$

D. $x = 24$, $y = 18$



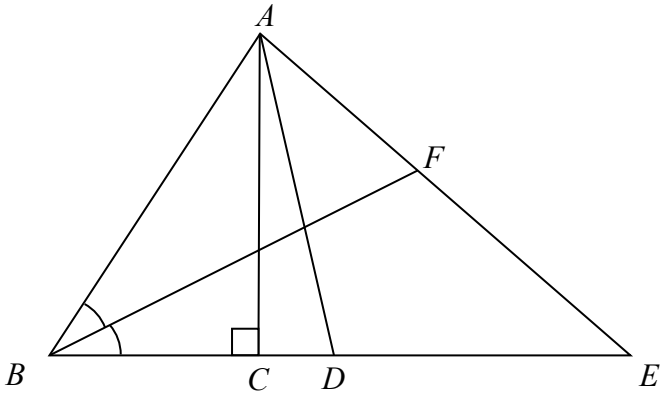
16. In $\triangle ABE$, AFE and $BCDE$ are straight lines. $BD = DE$, $AC \perp BE$ and $\angle ABF = \angle EBF$.
Which of the following **MUST** be a median of $\triangle ABE$?

A. AC

B. AD

C. BD

D. BF



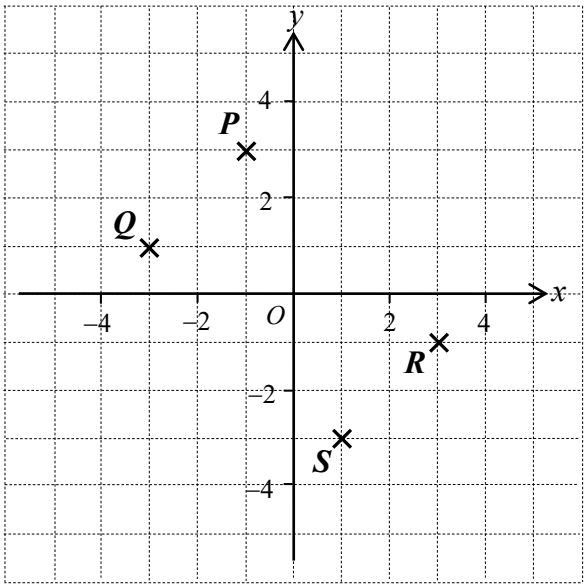
17. In the figure, which point can be represented by $(1, -3)$?

A. P

B. Q

C. R

D. S



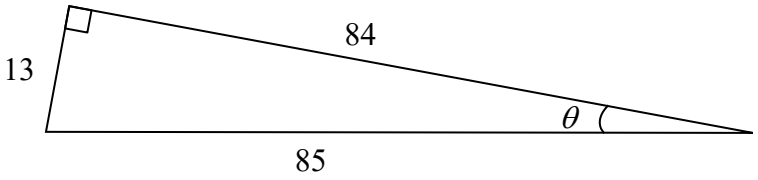
18. Find the value of $\tan\theta$ in the figure.

A. $\frac{13}{84}$

B. $\frac{13}{85}$

C. $\frac{84}{13}$

D. $\frac{84}{85}$



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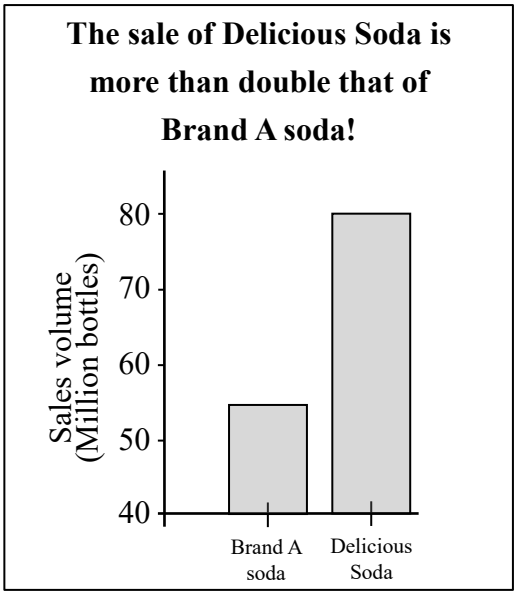
19. The following is the promotional poster of Delicious Soda. Mr Chan believes that the sale of Delicious Soda is more than double that of Brand A soda.



Which of the following statements is the best reason that Mr Chan is **misled** by the above poster ?

A. The scale of vertical axis in the diagram does not take 1 as one unit.

B. There is no comparison of the sales of other brands of drinks.

C. The scale of vertical axis in the diagram does not start from zero.

D. The scale of horizontal axis in the diagram is not shown in values.

20. David applied for a scholarship. The table below shows the weight and his score of each judging criterion. The full marks of all criteria are equal.

	Judging Criteria			
	Interview Performance	School Results	Extra-curricular Activities	Awards
Score	25	30	15	10
Weight	5	3	1	1

Find the weighted mean score of David.

A. 2.5

B. 20

C. 24

D. 60

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

21. A teacher used directed numbers to represent the changes of the weights of students.
For example : –5 kg represents a decrease of 5 kg in weight.

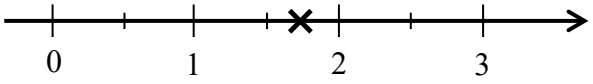
Use a directed number to represent each of the following situations :

(i) the weight of the monitress has decreased by 2 kg ;
(ii) the weight of the monitor has increased by 6 kg .

22. Round off 0.034 567 to 3 significant figures.

23. Use the symbol '×' to mark the number $\sqrt{3}-1$ on the number line given in the **ANSWER BOOKLET**.

Example : $\sqrt{3}$ is marked on the number line below.



24. A novel is sold at 30% off and the selling price is \$266 . Find the marked price of the novel.

25. Find the values of x and y in the following sequence of odd numbers.

$$1\,,\quad 3\,,\quad x\,,\quad y\,,\quad 9\,,\quad 11\,,\ldots$$

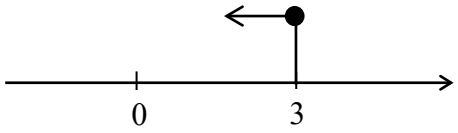
26. Expand $4a(a - 7b)$.

27. Expand $(2x + 1)^2$.

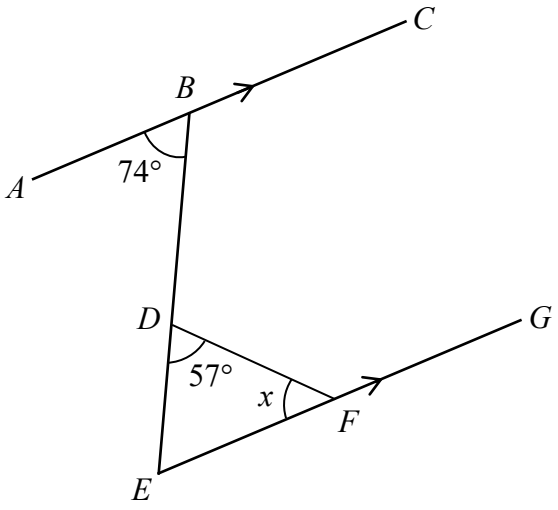
28. Simplify $\left(\frac{6h}{5k^2}\right)\left(\frac{5k}{3h^2}\right)$.

29. Make x the subject of the formula $y = \frac{7x + 4}{3}$.

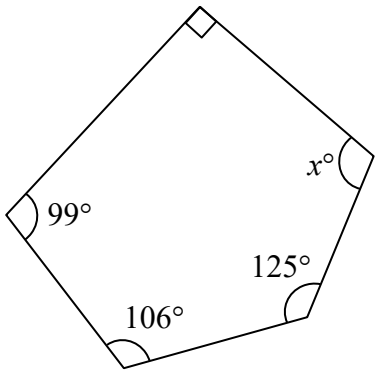
30. According to the diagram, write down an inequality in x .



31. In the figure, ABC , BDE and EFG are straight lines. ABC // EFG , $\angle ABD = 74°$, $\angle EDF = 57°$ and $\angle DFE = x$. Find x .

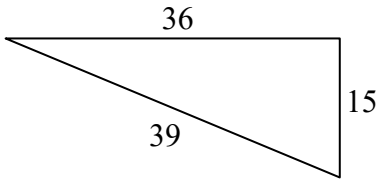


32. The figure shows a pentagon. Find the value of x.

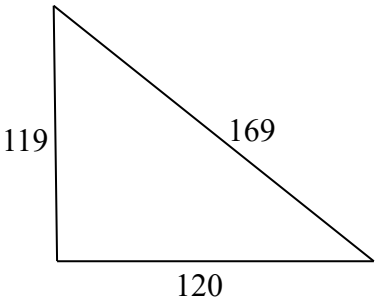


33. Which one of the following **MUST NOT** be a right-angled triangle ?

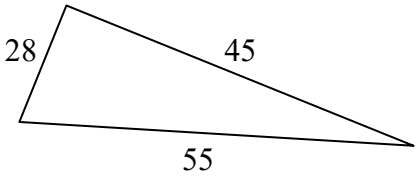
Triangle A



Triangle B

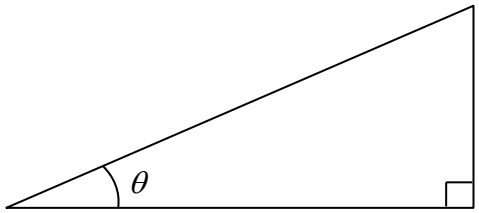


Triangle C



34. Find the distance between two points $H(9, -8)$ and $K(-3, 8)$ in the rectangular coordinate plane.

35. In the figure, $\sin\theta = \frac{2}{7}$. Find θ correct to 3 significant figures.

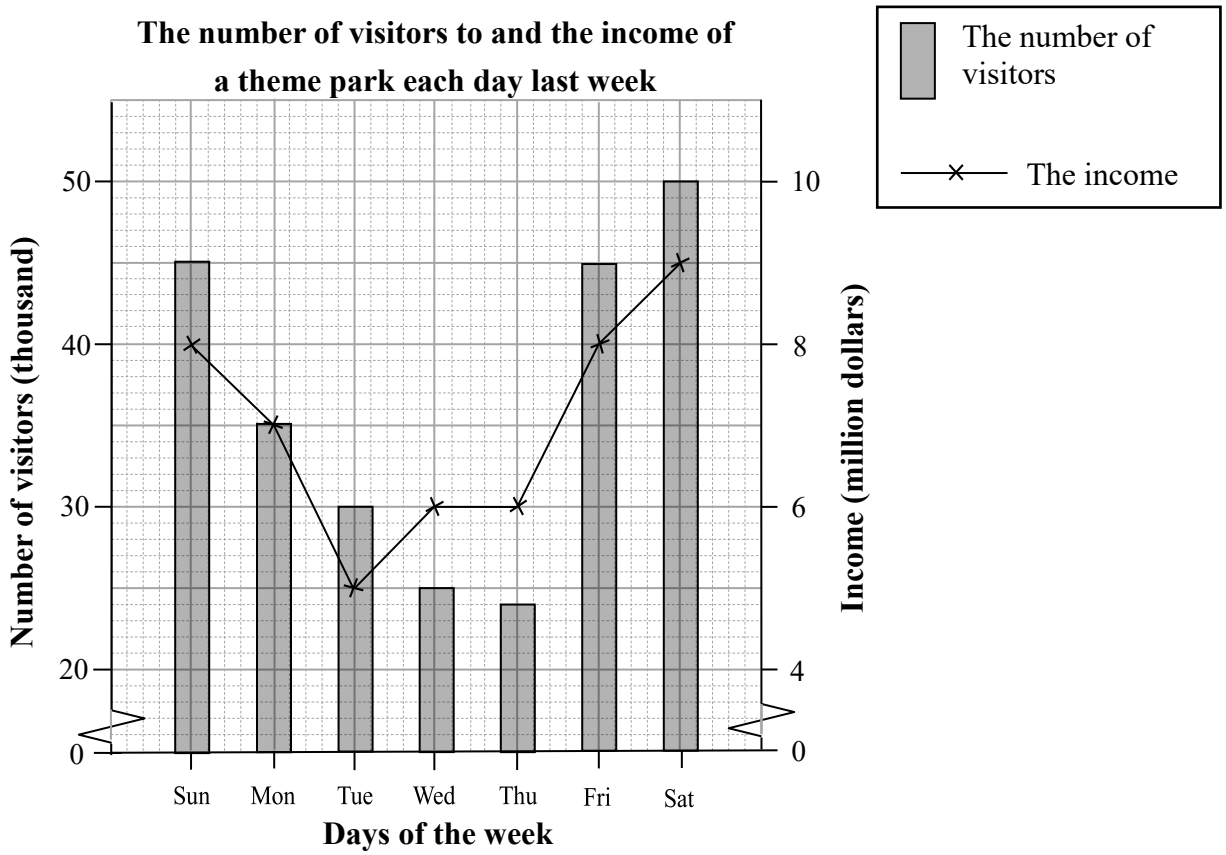


36. The following data is the number of patients in a clinic in the last 20 days.

15	22	33	18	9
12	5	28	35	40
25	56	15	7	38
27	21	34	31	48

Use the data to complete the two frequency distribution tables in the **ANSWER BOOKLET**.

37. The diagram below shows the number of visitors to and the income of a theme park each day last week.



According to the above diagram, answer the following questions.

(a) What was the total number of visitors to the theme park last week ?

(b) What was the difference between the highest and lowest incomes of the theme park last week ?

38. The following data shows the scores of 10 basketball players in a competition.

9 26 14 14 27 16 22 12 26 14

Find the mean and the median of the above data.

39. The table below shows the travelling time of Class 3A students from home to school.

Time (minutes)	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59
Frequency	6	11	2	5	4

Find the modal class of the travelling time of Class 3A students from home to school.

SECTION C: All working must be clearly shown.
Write the mathematical expressions, answers and statements/conclusions in the spaces provided in the ANSWER BOOKLET.

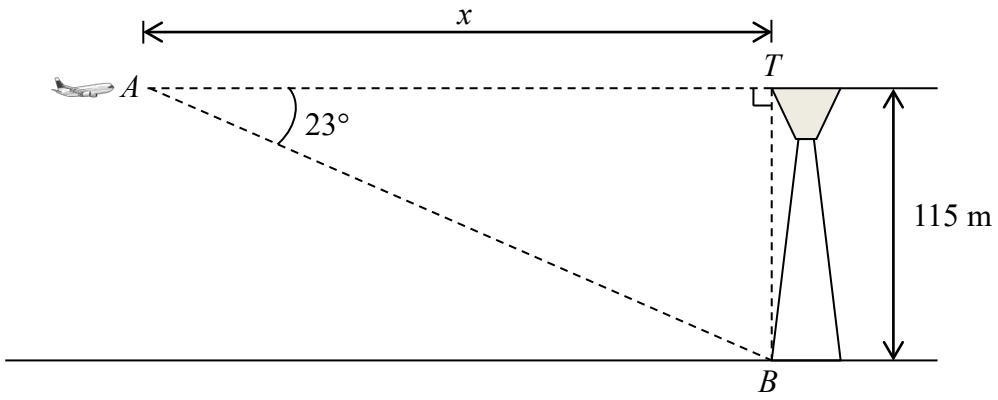
40. Karen deposits \$8 000 in a bank at an interest rate of 5% p.a. **compounded** yearly. Find the amount she will receive after 3 years.

41. Complete the table for the equation $y = -\frac{2}{3}x + 1$ in the **ANSWER BOOKLET**.

x	-3	0	3
y		1	

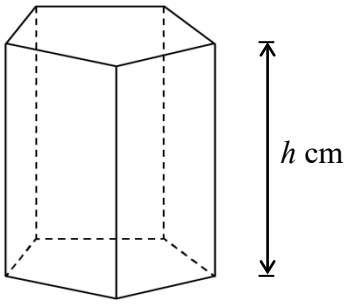
According to the table, plot the graph of this equation on the rectangular coordinate plane given in the **ANSWER BOOKLET**.

42. The figure shows an airport control tower TB. An aeroplane is located at point A. Point A and point T are at the same height. The angle of depression of point B from point A is $23°$, $AT \perp TB$ and $TB = 115$ m.

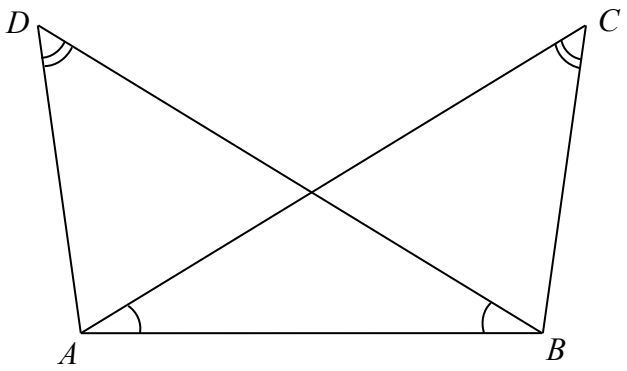


Find the horizontal distance x between the aeroplane and the control tower, correct to 3 significant figures.

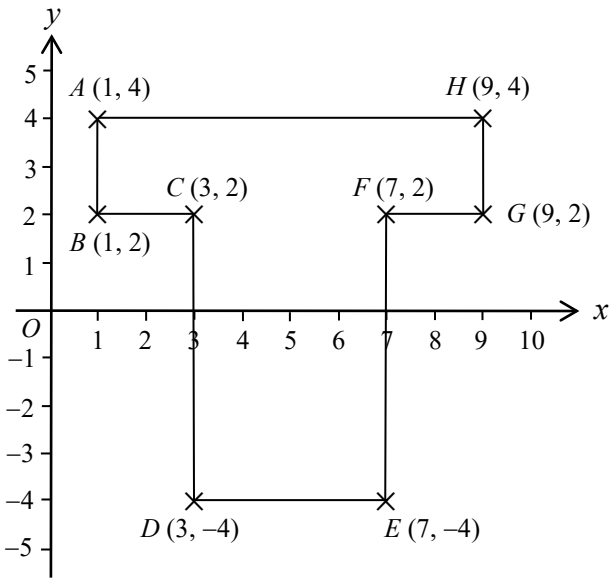
43. The figure shows a right prism. Its volume is $288\ \text{cm}^3$ and its base area is $12\ \text{cm}^2$. The height of the prism is h cm. Find the value of h.



44. In the figure, AC and BD are straight lines. $\angle ABD = \angle BAC$ and $\angle ADB = \angle BCA$. Prove that $\triangle ABD \cong \triangle BAC$.



45. Find the area of polygon $ABCDEFGH$ in the figure.



46. Solve the simultaneous equations $\begin{cases} 2x-3y=7 \\ x+3y=8 \end{cases}$.

47. A two-digit number is formed by the digits $1,\ 4,\ 8$ at random. The digits can be used again. For example: $18,\ 44$

(a) Some of the possible outcomes are given in the table provided in the **ANSWER BOOKLET**. Fill the remaining possible outcomes in the table.

(b) Find the probability that the two-digit number formed is a multiple of 4.

END OF PAPER

Do not write on this page.

Answers written on this page will not be marked.