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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. $7 \times 7 \times 7 \times 7 \times 7 =$

A. 7×5 .

B. 77777 .

C. 5^7 .

D. 7^5 .

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. The rent for a store is $60 000 per month. Starting from next month, the rent will increase by 20% . Find the rent for the store next month.

A. $50 000
B. $60 020
C. $72 000
D. $75 000

4. 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. $6 : 5$

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

6. Which of the following points lies on the straight line $3x + 5y + 11 = 0$?

A. $(8, -7)$

B. $(7, -8)$

C. $(-8, 7)$

D. $(-7, 8)$

7. $\dfrac{5a^{-3}}{a^4} =$

A. $\dfrac{5}{a}$.

B. $5a^7$.

C. $\dfrac{1}{5a^7}$.

D. $\dfrac{5}{a^7}$.

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 $x \leq y$, which of the following inequalities **MUST** be correct ?

A. $x + 7 \geq y + 7$

B. $x - 7 \geq y - 7$

C. $\frac{x}{7} \geq \frac{y}{7}$

D. $-7x \geq -7y$

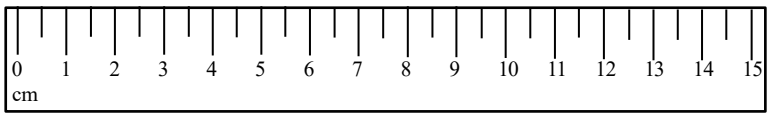
11. Kelvin uses the ruler shown in the figure to measure the length of a pencil and the result is 12.5 cm . Find the percentage error of the measured value.

A. 1.67%

B. 2%

C. 4%

D. 83.3%



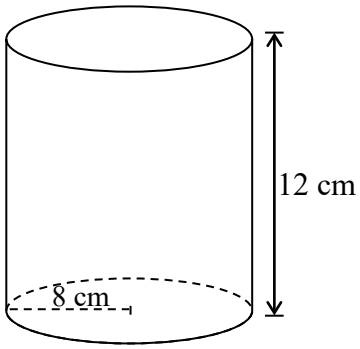
12. The figure shows a solid right circular cylinder. Its base radius is 8 cm and its height is 12 cm. Find the curved surface area of the circular cylinder. Express the answer in terms of π.

A. 768π cm^2

B. 320π cm^2

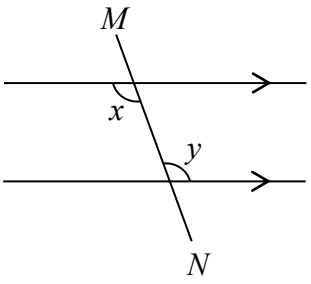
C. 192π cm^2

D. 96π cm^2

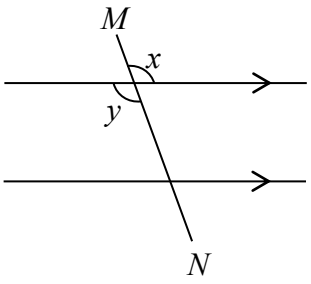


13. In each of the following figures, MN is a straight line. Which figure shows that x and y are a pair of corresponding angles ?

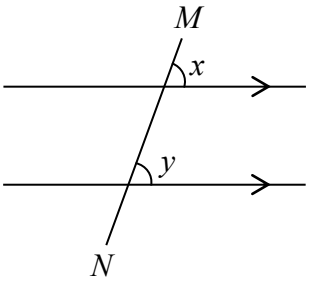
A.



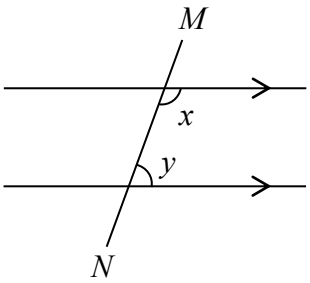
B.



C.



D.

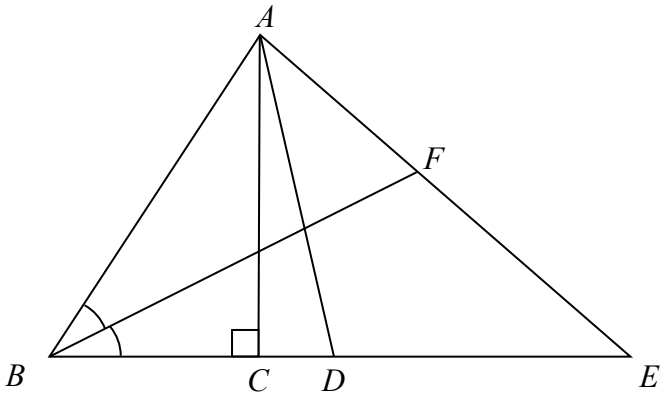


14. Which of the following **MUST** be a regular polygon ?

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

15. In $\triangle ABE$, 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



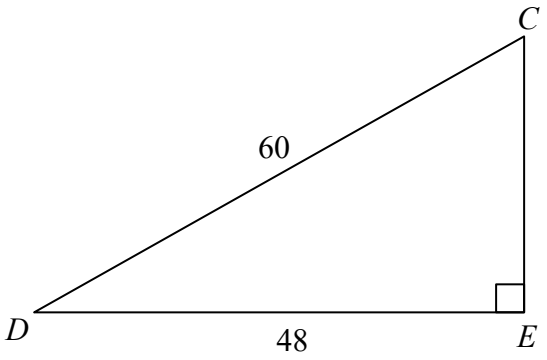
16. In the figure, $\triangle CDE$ is a right-angled triangle, $CD = 60$ and $DE = 48$. Find CE.

A. $60^2 + 48^2$

B. $60^2 - 48^2$

C. $\sqrt{60^2 + 48^2}$

D. $\sqrt{60^2 - 48^2}$



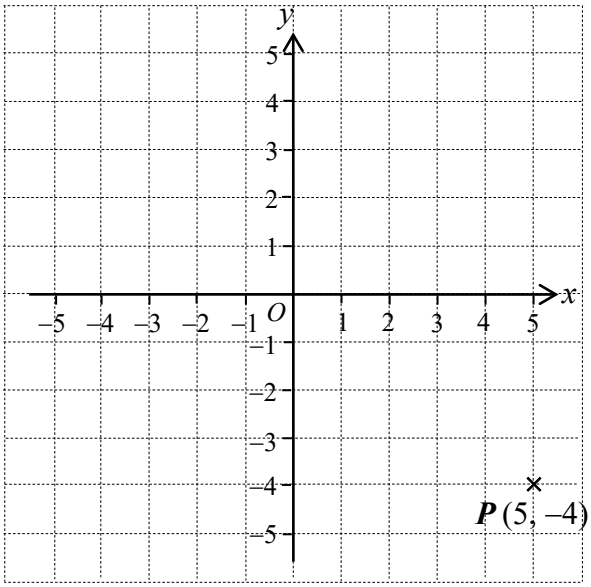
17. In the figure, $\boldsymbol{P}(5, -4)$ is rotated about the origin O through $270°$ in an anticlockwise direction to $\boldsymbol{P'}$. Find the coordinates of $\boldsymbol{P'}$.

A. $(-4, -5)$

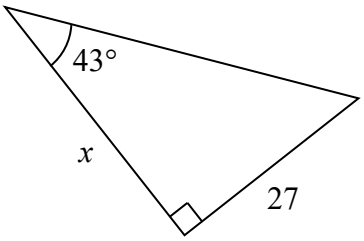
B. $(4, 5)$

C. $(-5, 4)$

D. $(-5, -4)$

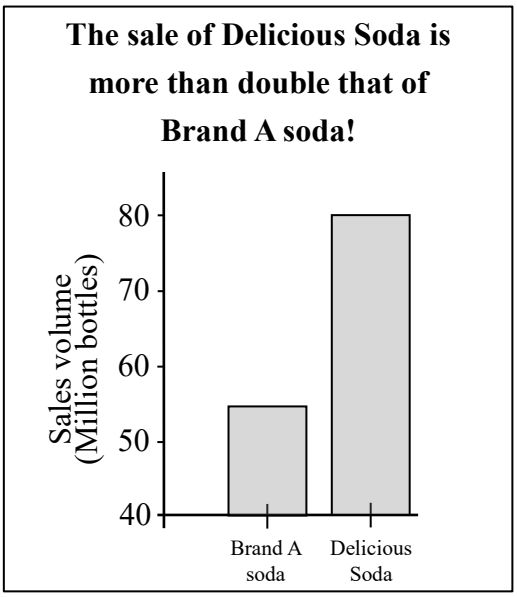


18. Referring to the figure, find x correct to 3 significant figures.



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

19. The 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. 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 $-3(-7) + 5(-2)$.

22. Round off $0.034\,567$ to 3 significant figures.

23. 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 $\$y$.

24. Solve the equation $3x + 4 = 2(9 - 2x)$.

25. Find the value of $(-5)^{-1}$.

26. Use scientific notation to represent $0.000\,56$.

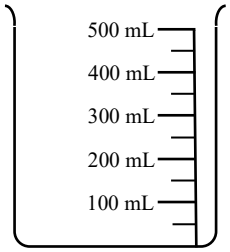
27. Simplify $(2a + 8b) - (3b - 2a)$.

28. Factorise $3a(2x - y) - 5(2x - y)$.

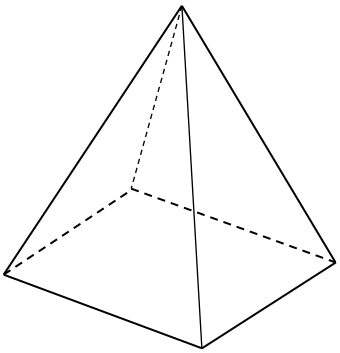
29. Expand $(2x + 1)^2$.

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

31. Susan uses the beaker shown in the figure to measure the volume of a cup of water and the result is 300 mL (correct to the nearest 50 mL). Find the maximum absolute error of the measurement.

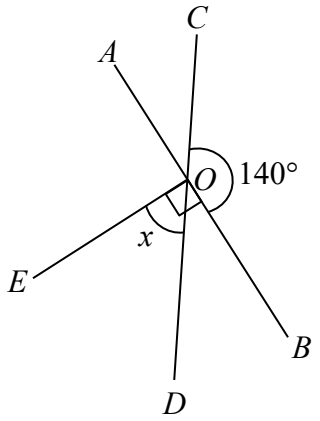


32. The figure shows the diagram of a right pyramid:



Referring to the sketch shown above, add 1 solid line and 1 dotted line in the figure provided in the **ANSWER BOOKLET** so as to form a diagram of a **right prism**.

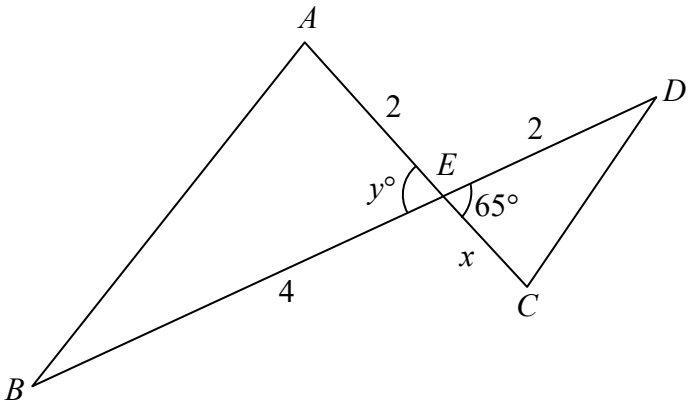
33. In the figure, AOB and COD are straight lines. $\angle BOE$ is a right angle, $\angle BOC = 140°$ and $\angle DOE = x$. Find x.



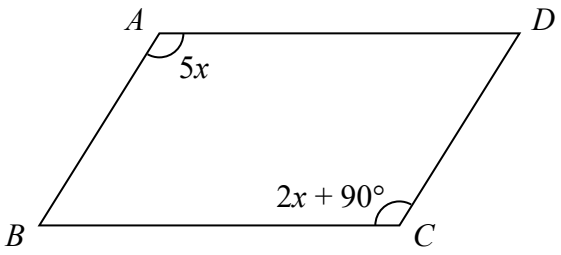
34. In the figure, $\triangle ABE \sim \triangle CDE$. Find

(a) the value of x ,

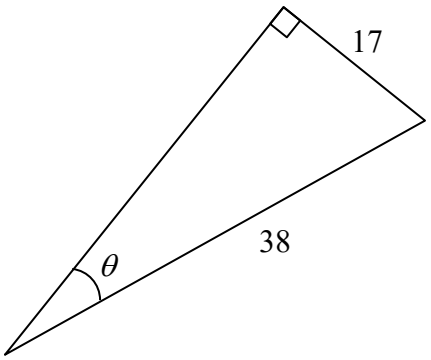
(b) the value of y .



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



36. Referring to the figure, find θ correct to 3 significant figures.

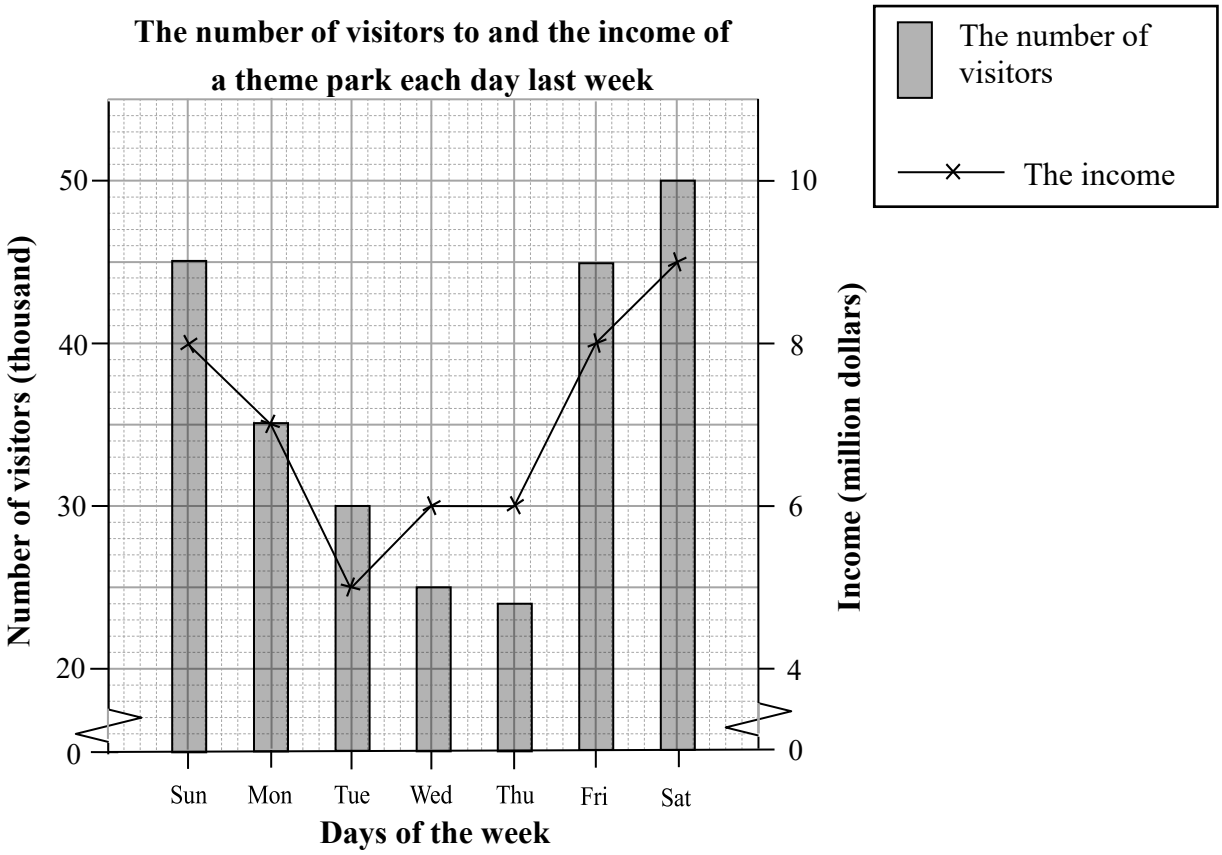


37. The following data is the number of patients in a clinic in the last 20 days.

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**.

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

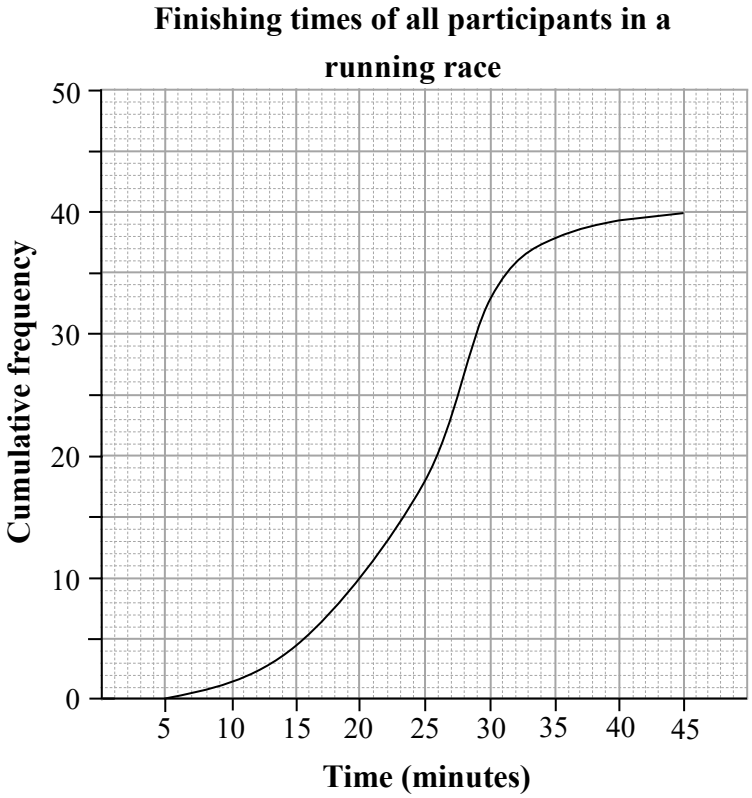


According to the above diagram, answer the following questions.

(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 ?

39. 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.

(a) How many participants were there in the race ?

(b) 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 ?

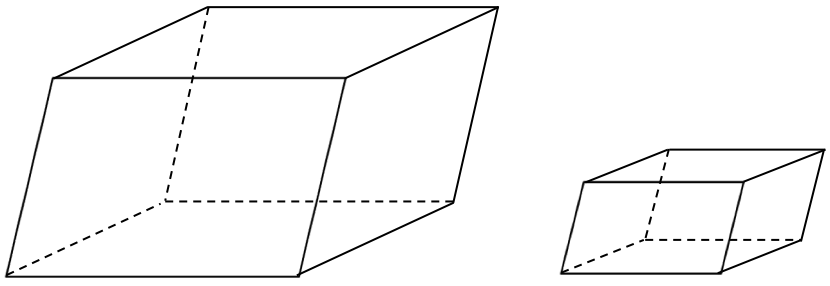
SECTION C: All working must be clearly shown.
Write the mathematical expressions, answers and statements/conclusions in the spaces provided in the ANSWER BOOKLET.

40. The tuition fee of a university is $\$50\,000$ this year. If the tuition fee is increased by 6% per year, find the tuition fee after two years.

41. A company offers party room rental services. If the room rental fee is shared among 5 people equally, each one pays $\$280$. Assuming the room rental fee is unchanged and equally shared among 8 people, find the average fee for each person.

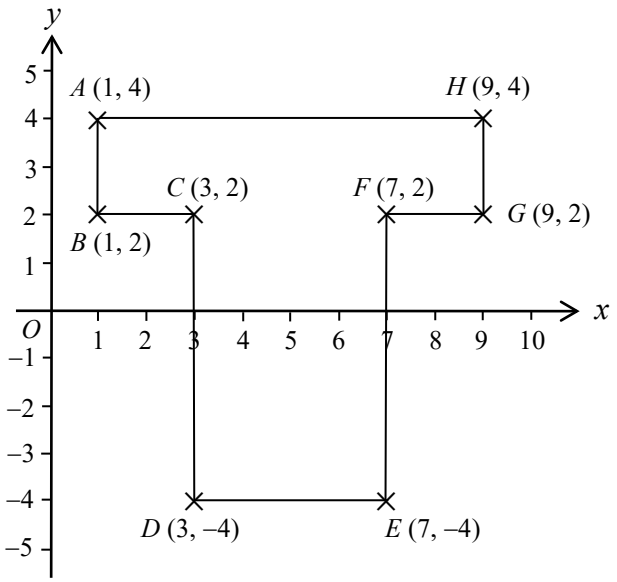
42. Solve the simultaneous equations $\begin{cases} 2x-3y=7 \\ x+3y=8 \end{cases}$.

43. 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.

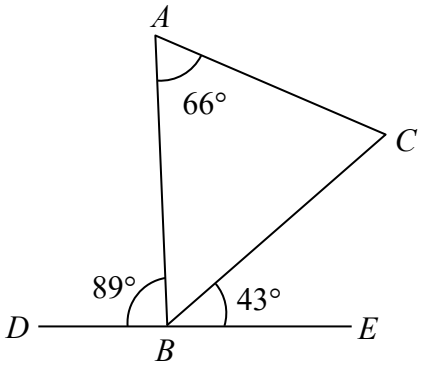


Solid A Solid B

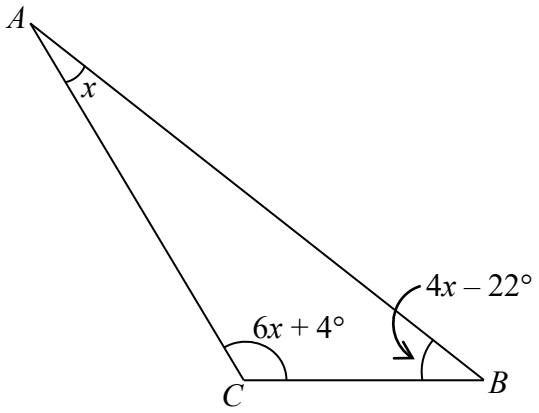
44. Find the area of polygon $ABCDEFGH$ in the figure.



45. In the figure, DBE is a straight line. $\angle BAC = 66°$, $\angle CBE = 43°$ and $\angle ABD = 89°$. Prove that $\triangle ABC$ is an isosceles triangle.



46. In the figure, $\angle BAC = x$, $\angle ABC = 4x - 22°$ and $\angle ACB = 6x + 4°$. Find x .



47. The following table shows the distribution of the heights of 20 track and field athletes of a secondary school.

Height (cm)	Class boundaries (cm)	Class mark (cm)	Frequency
150 – 154		152	2
155 – 159	154.5 – 159.5	157	3
160 – 164	159.5 – 164.5	162	
165 – 169	164.5 – 169.5	167	4
170 – 174		172	5
175 – 179	174.5 – 179.5	177	2

According to the above table, complete the frequency distribution table and the histogram in the **ANSWER BOOKLET**.

END OF PAPER

Do not write on this page.

Answers written on this page will not be marked.

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