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Education Bureau

Territory-wide System Assessment 2026

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. $6^3 =$

A. $3 \times 3 \times 3 \times 3 \times 3 \times 3$.

B. $6 \times 6 \times 6$.

C. 6×3 .

D. 63 .

2. Round off $103.934\ 7$ to 3 decimal places.

A. 103

B. 104

C. 103.934

D. 103.935

3. $m^2 + (-m)^2 =$

A. 0 .

B. m^4 .

C. $2m^2$.

D. $2m^4$.

4. Which of the following is an equation with the solution $x = -\frac{1}{4}$?

A. $x + 4 = 0$

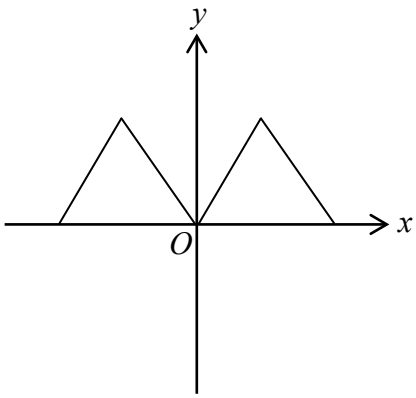
B. $x - 4 = 0$

C. $4x + 1 = 0$

D. $4x - 1 = 0$

5. Which of the following may represent the graph of the equation $3x + y - 4 = 0$?

A.



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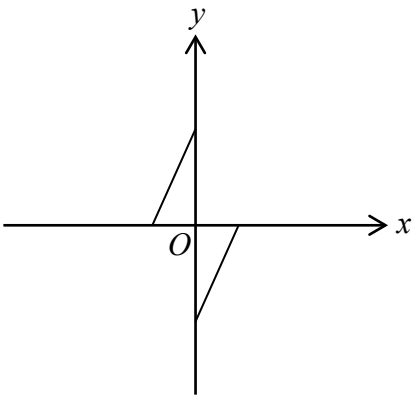

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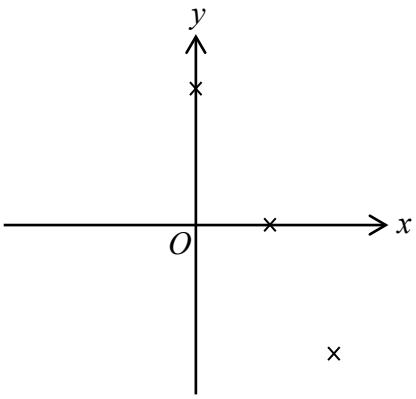

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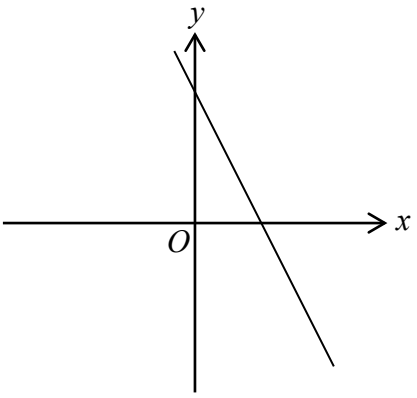


6. A family visits a theme park. They buy 2 adult tickets and 3 child tickets, paying a total of $\$1\,000$. It is given that the price of 1 adult ticket is $\$150$ more than that of 2 child tickets. Let the price of each adult ticket and each child ticket be $\$x$ and $\$y$ respectively. Which of the following pairs of simultaneous equations shows the relations between x and y?

A. $\begin{cases} 2x+3y=1\,000 \\ x+2y=150 \end{cases}$

B. $\begin{cases} 2x+3y=1\,000 \\ x=2y+150 \end{cases}$

C. $\begin{cases} 3x+2y=1\,000 \\ 2y=x+150 \end{cases}$

D. $\begin{cases} 3x+2y=1\,000 \\ y=2x+150 \end{cases}$

7. $6.83\times10^{-5} =$

A. $0.000\,006\,83$.

B. $0.000\,068\,3$.

C. $683\,000$.

D. $68\,300\,000$.

8. Determine whether each of the following expressions is an expansion or a factorisation.

(i)	$(a+3)(2a-1)(a+2)$ $= 2a^3+9a^2+7a-6$	(ii)	$2a^3+9a^2+7a-6$ $= (a+3)(2a-1)(a+2)$

A. (i) Expansion (ii) Expansion

B. (i) Expansion (ii) Factorisation

C. (i) Factorisation (ii) Expansion

D. (i) Factorisation (ii) Factorisation

9. $\frac{2}{a}-\frac{1}{5a}=$

A. $9a$.

B. $-\frac{1}{4a}$.

C. $\frac{1}{5a}$.

D. $\frac{9}{5a}$.

10. If $x<-1.6$, which of the following **CANNOT** be a value of x ?

A. -1

B. -2

C. -3

D. -4

11. The thickness of a smart watch is measured as 9.7 mm (correct to the nearest 0.1 mm). Which of the following are the lower limit and upper limit of the actual thickness of the smart watch ?

	Lower limit	Upper limit
A.	9 mm	10 mm
B.	9.6 mm	9.8 mm
C.	9.65 mm	9.75 mm
D.	9.69 mm	9.71 mm

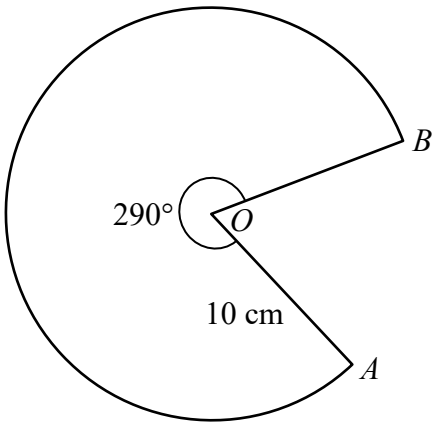
12. In the figure, the radius of sector OAB is 10 cm . If reflex $\angle AOB = 290°$, then the arc length of the sector =

A. $\pi(10)^2 \times \frac{290°}{360°}$ cm .

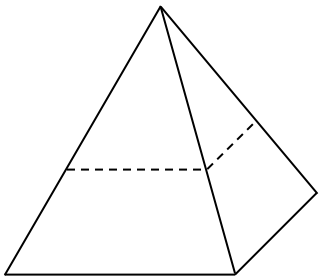
B. $\pi(20)^2 \times \frac{290°}{360°}$ cm .

C. $2\pi(10) \times \frac{290°}{360°}$ cm .

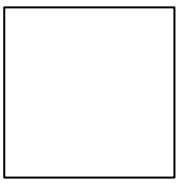
D. $2\pi(20) \times \frac{290°}{360°}$ cm .

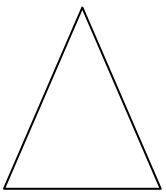


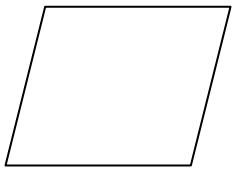
13. A right pyramid with a square base is placed horizontally as shown. Chloe cuts along the dotted line to obtain a section parallel to the base.

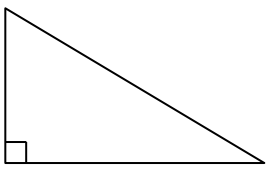


Which of the following can be the section?

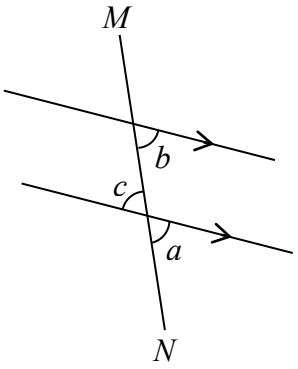
A. 

B. 

C. 

D. 

14. In the figure, MN is a straight line. Which of the following statements about a , b and c must be correct?



I. a and b are a pair of corresponding angles.

II. a and c are a pair of interior angles on the same side.

III. b and c are a pair of alternate interior angles.

A. I only

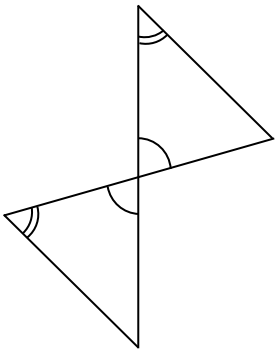
B. II only

C. I and III only

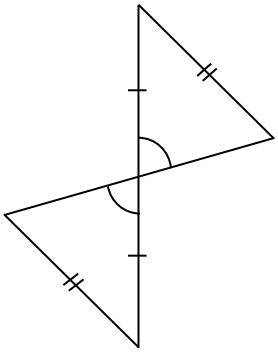
D. II and III only

15. Which of the following pairs of triangles must be congruent?

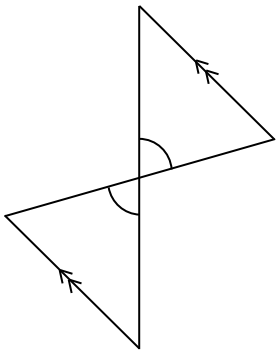
A.



B.



C.



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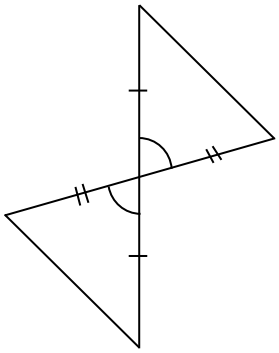

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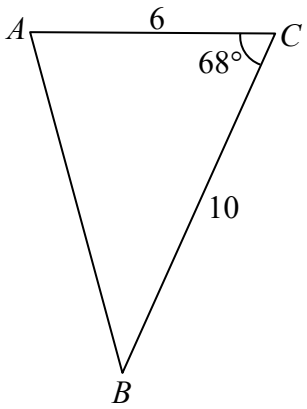
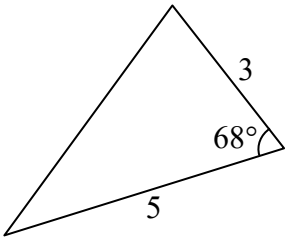
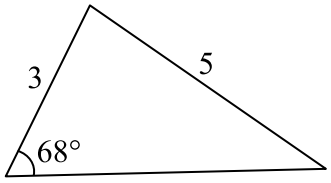


Which of the following triangles must be similar to $\triangle ABC$ above?

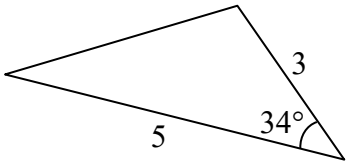
A.



B.



C.



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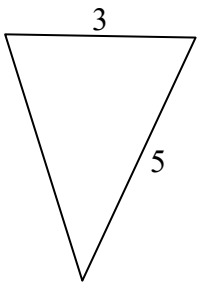


17. In the rectangular coordinate plane, $P\,(-9, -7)$ and $Q\,(12, 18)$ are two points on a straight line L. The slope of L =

A. $\frac{3}{11}$.

B. $\frac{11}{3}$.

C. $\frac{21}{25}$.

D. $\frac{25}{21}$.

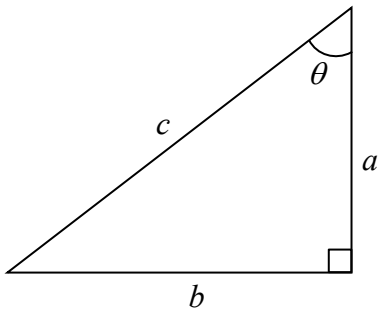
18. In the figure, $\tan\theta =$

A. $\frac{a}{b}$.

B. $\frac{a}{c}$.

C. $\frac{b}{a}$.

D. $\frac{b}{c}$.



19. The table below shows the numbers of participants from S1 to S6 in a joint school music competition.

Class level	S1	S2	S3	S4	S5	S6
Number of participants	19	25	27	23	22	4

Miss Wong analyses the proportion of participants at each level relative to the total number of participants. Which of the following is the most suitable statistical chart for presenting the data above?

A. Pie chart

B. Histogram

C. Broken line graph

D. Cumulative frequency curve

20. Vincent joined the school football team selection. The following table shows the weight and his score in each judging criterion in this selection. The full scores of each criterion are equal.

	Judging Criterion			
	Shooting skills	Ball control skills	Physical fitness	Teamwork
Score	5	8	7	3
Weight	7	6	4	3

Find the weighted mean score of Vincent.

A. 30

B. 6

C. 5.75

D. 5.22

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

21. Express 30 as a product of prime factors.

22. A game uses a directed number to represent the distance that a participant jumps forwards or backwards from the starting point.
For example,
$-52\,\text{cm}$ represents that the participant jumps $52\,\text{cm}$ backwards from the starting point.

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

(i) Grace jumps $68\,\text{cm}$ forwards from the starting point.
(ii) Leo jumps $37\,\text{cm}$ backwards from the starting point.

23. If $\sqrt{a} = 4$, find the value of a.

24. The cost of a laptop is \$5 000. It is now sold for \$5 650. Find the percentage profit.

25. In a football match between Team A and Team B, there are $32\,000$ fans and $18\,000$ fans of Team A and Team B respectively. Find the ratio of the number of fans of Team A to the total number of fans of both teams.

26. The nth term of a sequence is $3n + 2$. Find the value of the 4th term of the sequence.

27. Write down the constant term of the polynomial $6x^4 + 7x + 2$.

28. Expand $(x - y)(3x + y)$.

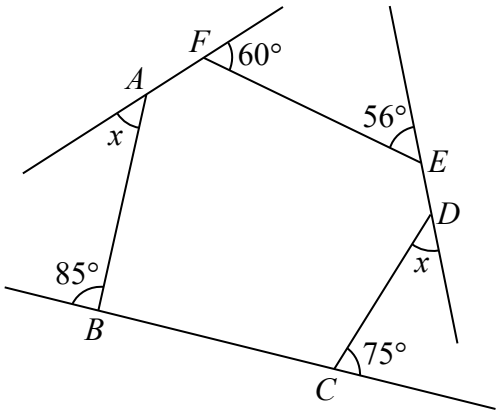
29. Factorise $16m^2 - 9$.

30. Consider the formula $W = \dfrac{2xy}{x - y}$. If $x = 3$ and $y = -5$, find the value of W .

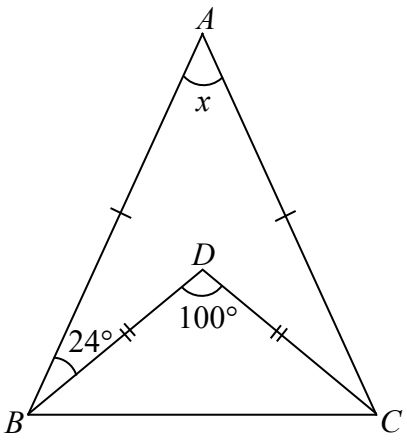
31. Solve the inequality $2y > 3y - 30$.

32. The radius of a solid sphere is 15 cm . Find the volume of the sphere. Express the answer in terms of π .

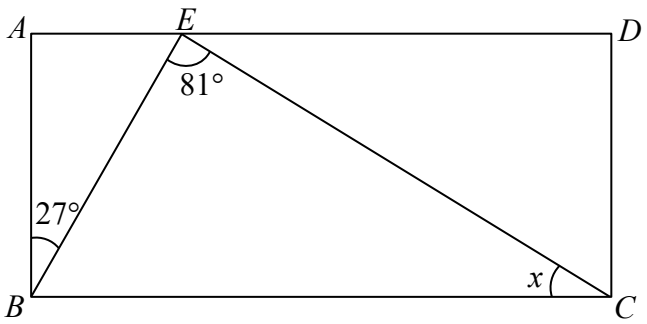
33. The figure shows a hexagon $ABCDEF$ and its exterior angles. Find x .



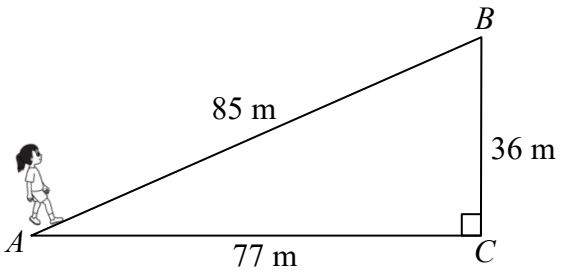
34. In the figure, $\triangle ABC$ and $\triangle BCD$ are isosceles triangles, where $AB = AC$ and $BD = CD$. $\angle ABD = 24°$, $\angle BDC = 100°$ and $\angle BAC = x$. Find x .



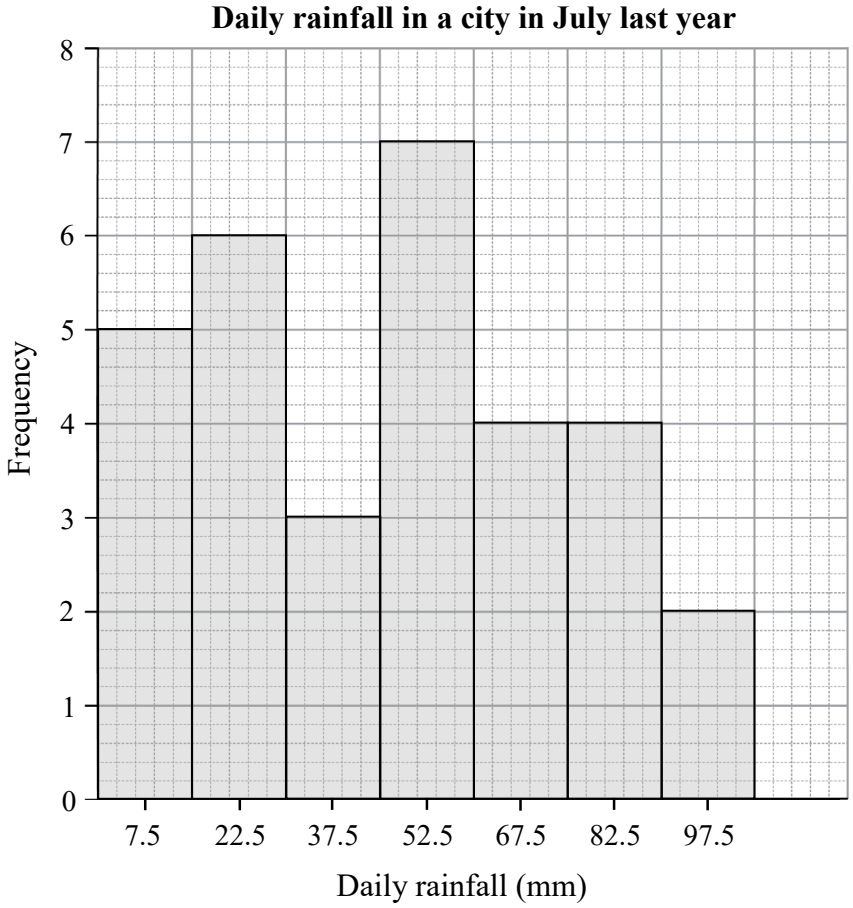
35. In the figure, $ABCD$ is a rectangle, E is a point on AD . If $\angle ABE = 27°$, $\angle BEC = 81°$ and $\angle BCE = x$, find x .



36. In the figure, Kate walks upwards along path AB of length 85 m , the vertical distance BC is 36 m and the horizontal distance AC is 77 m . Find the gradient of the path AB .



37. The histogram below shows the distribution of daily rainfall in a city in July last year.



According to the above histogram, answer the following questions.

(a) Complete the frequency distribution table in the **ANSWER BOOKLET**.

(b) How many days in July had rainfall of not less than 75 mm ?

(c) Find the modal class of the daily rainfall for July.

38. The following data shows the travelling times (minutes) of 12 students from home to school yesterday.

6 10 12 14 18 19 22 23 28 30 30 40

Find the mean and the mode of the above data.

39. The following table shows the numbers of musicians in different sections of an orchestra.

Section	Strings	Wind	Percussion
Number of people	38	28	14

According to the table above, find the relative frequency of the number of musicians in the strings section of the orchestra.

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. In a restaurant, customers can get a discount for any purchase of 888 or more. Lily's family ordered 3 dishes at the restaurant, priced at $\$\underline{308}$, $\$\underline{461}$ and $\$\underline{212}$ respectively. Lily claims that they can get the discount.

Based on the description above, use same estimation strategy (round up / round down) to give an appropriate approximation for each **UNDERLINED VALUE**. Hence, do you agree with Lily's claim ? Explain your answer.

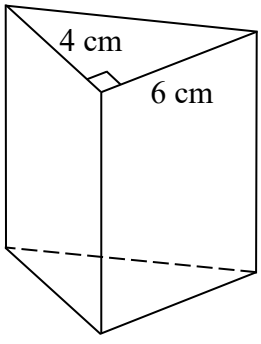
41. At a snack shop, candy is sold at $\$12$ per 100 g . Adam buys 320 g of candy. How much does he pay?

42. Complete the table for the equation $2x-3y-6=0$ in the **ANSWER BOOKLET**.

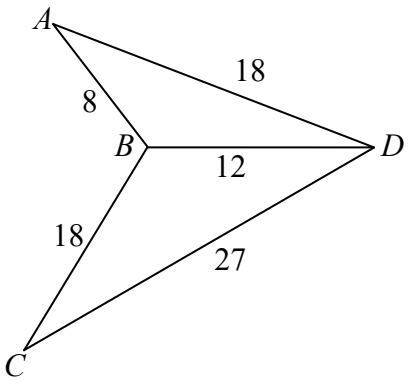
x	-3	0	3
y		-2	

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

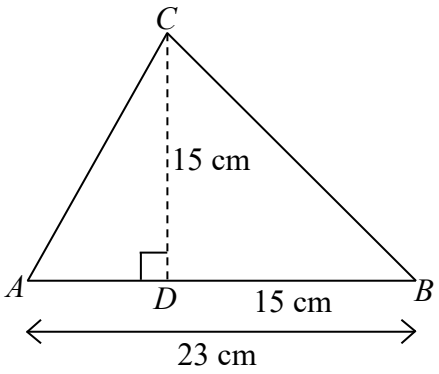
43. The figure shows a solid right prism. Its base is a right-angled triangle. If the volume of the prism is $108\,\text{cm}^3$, find the height of the prism.



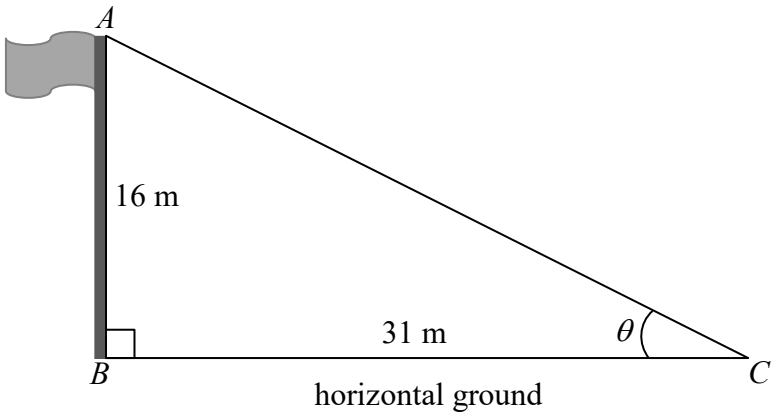
44. In the figure, $AB = 8$, $AD = BC = 18$, $BD = 12$ and $CD = 27$. Prove that $\triangle ABD \sim \triangle DBC$.



45. In the figure, CD is the height of $\triangle ABC$. $AB = 23$ cm and $BD = CD = 15$ cm , find AC .



46. In the figure, the height of a vertical flagpole AB is 16 m. B and C are on the horizontal ground, where $BC = 31$ m. Find the angle of elevation θ of A from C correct to 3 significant figures.



47. The table below shows the amounts of daily pocket money for 25 students.

Amount ($)	1 – 40	41 – 80	81 – 120	121 – 160	161 – 200
Frequency	5	7	6	4	3

(a) According to the above table, complete the frequency distribution table in the **ANSWER BOOKLET**.

(b) Find the mean of the amounts of their daily pocket money.

END OF PAPER

Do not write on this page.

Answers written on this page will not be marked.