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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. Find the least common multiple (L.C.M.) of $3^2 \times 7$ and $2^2 \times 3 \times 7$.

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

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

C. $2 \times 3 \times 7$

D. 3×7

2. Which of the following is a rational number ?

A. $-\sqrt{10}$

B. $\sqrt{2}$

C. 3.14

D. π

3. There are 840 students in a school and 350 of them are boys . Find the ratio of the number of boys to the number of girls in the school.

A. 5 : 7

B. 7 : 5

C. 5 : 12

D. 12 : 5

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

A. 0 .

B. m^4 .

C. $2m^2$.

D. $2m^4$.

5. Eric is y years old now. His father is 36 years older than him. After two years, his father's age will be 3 times Eric's age. Which of the following equations can be used to find the value of y ?

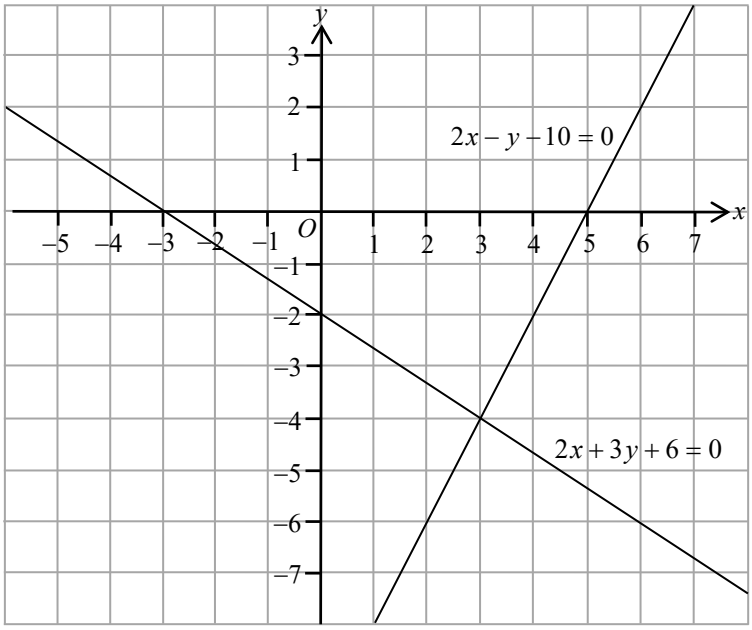
A. $3y + 2 = y + 36$

B. $3(y + 2) = y + 36$

C. $y + 2 = 3(y + 36 + 2)$

D. $3(y + 2) = (y + 36) + 2$

6. The figure below shows the graphs of the equations $2x+3y+6=0$ and $2x-y-10=0$.



Solve the simultaneous equations $\begin{cases} 2x+3y+6=0 \\ 2x-y-10=0 \end{cases}$ graphically.

A. (3, –4)

B. (5, 0)

C. (0, –2)

D. (–4, 3)

7. $(-7)^{-2}$ =

A. -49.

B. 49.

C. $-\frac{1}{49}$.

D. $\frac{1}{49}$.

8. Which of the following polynomials is in descending order of powers of x ?

A. $4x^2+3x+5$

B. $3x+4x^2+5$

C. $5+4x^2+3x$

D. $5+3x+4x^2$

9. Which of the following is an identity ?

A. $x=3$

B. $2(x+3)=2x+3$

C. $(x+3)^2=x^2+9$

D. $x+3=3+x$

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

A. -1

B. -2

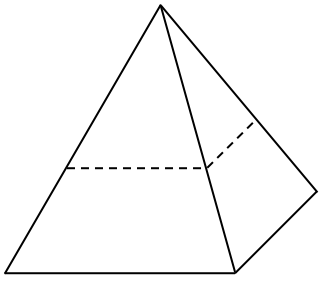
C. -3

D. -4

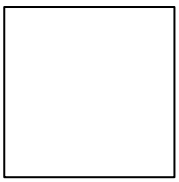
11. The thickness of a smart watch is measured as 9.7 mm (correct to the nearest 0.1 mm). Which of the following are the lower limit and upper limit of the actual thickness of the smart watch ?

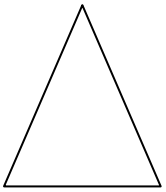
	Lower limit	Upper limit
A.	9 mm	10 mm
B.	9.6 mm	9.8 mm
C.	9.65 mm	9.75 mm
D.	9.69 mm	9.71 mm

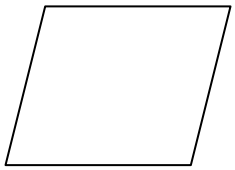
12. A right pyramid with a square base is placed horizontally as shown. Chloe cuts along the dotted line to obtain a section parallel to the base.

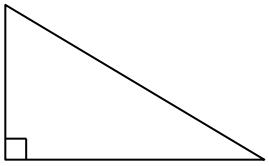


Which of the following can be the section?

A. 

B. 

C. 

D. 

13. The base area of a solid pyramid is $15\,\text{cm}^2$ and its height is 8 cm . Find the volume of the pyramid.

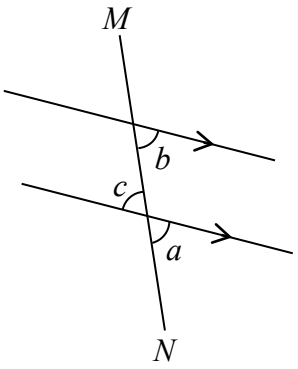
A. $\frac{1}{3}(15)(8)\ \text{cm}^3$

B. $(15)(8)\ \text{cm}^3$

C. $\frac{4}{3}(15)(8)\ \text{cm}^3$

D. $4(15)(8)\ \text{cm}^3$

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

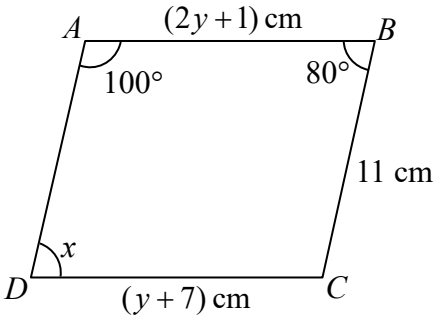
15. In the figure, $ABCD$ is a parallelogram. If $AB = (2y+1)\text{ cm}$, $BC = 11\text{ cm}$, $CD = (y+7)\text{ cm}$, $\angle DAB = 100°$, $\angle ABC = 80°$ and $\angle CDA = x$, find x and y.

A. $x = 80°$, $y = 5$

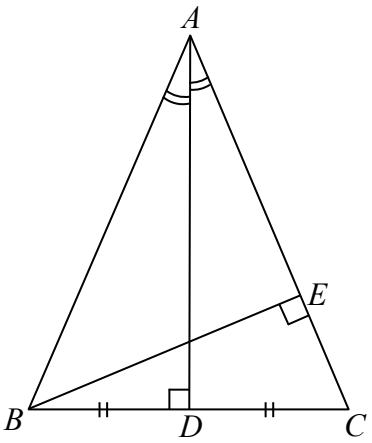
B. $x = 80°$, $y = 6$

C. $x = 100°$, $y = 5$

D. $x = 100°$, $y = 6$



16. In the figure, BDC and AEC are straight lines. It is given that $AD \perp BC$, $AC \perp BE$, $BD = DC$ and $\angle BAD = \angle CAD$.



Which of the following is **NOT** correct?

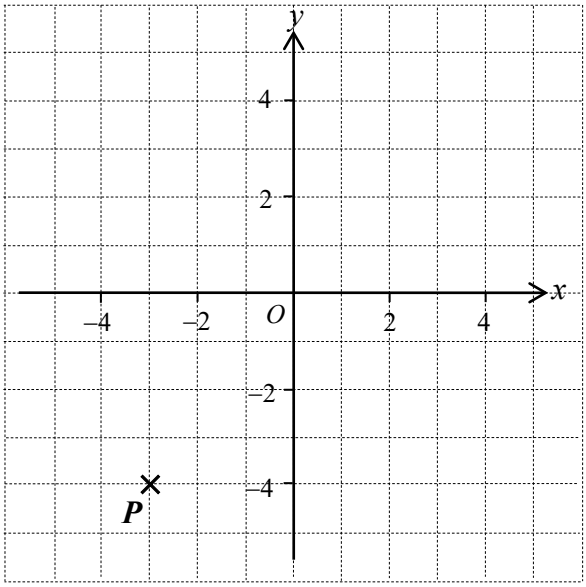
A. AD must be an angle bisector of $\triangle ABC$.

B. AD must be a median of $\triangle ABC$.

C. BE must be an altitude of $\triangle ABC$.

D. BE must be a perpendicular bisector of $\triangle ABC$.

17. Find the coordinates of point $\boldsymbol{P}$ in the figure.



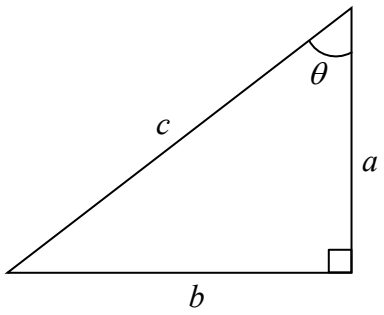
A. (−3, 4)

B. (−3, −4)

C. (−4, −3)

D. (−4, 3)

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



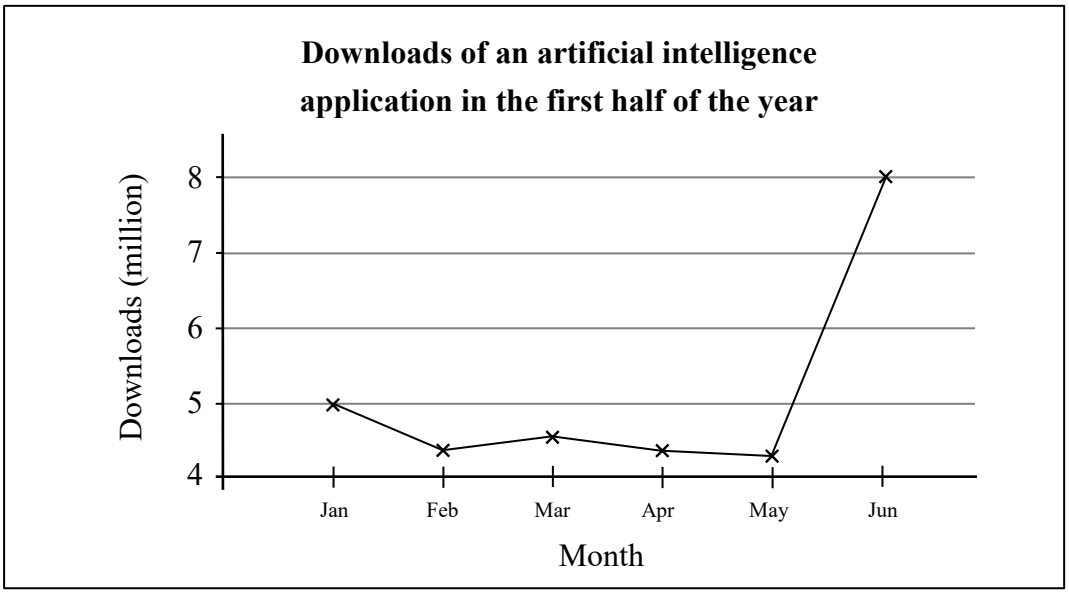
A. $\frac{a}{b}$.

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

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

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

19. The diagram below shows the downloads of an artificial intelligence application in the first half of the year. Based on the diagram below, Mr Cheung believes that the downloads of the application in June is 4 times that of January.



Which of the following statements is the best reason that Mr Cheung is **misled** by the above diagram?

A. The downloads did not increase continuously from January to June.

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

C. There are no comparisons with the downloads of other artificial intelligence applications.

D. There is no comparison with the downloads for the whole year.

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. 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.

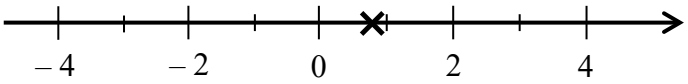
Use a directed number to represent each of the following situations.

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

22. Round off 369.258 to 2 significant figures.

23. Use the symbol '×' to mark the number $-\frac{12}{5}$ on the number line given in the **ANSWER BOOKLET**.

Example : $\frac{4}{5}$ is marked on the number line below.



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

25. Find the value of x in the following sequence of triangular numbers.

$$\ldots,\quad 10,\quad 15,\quad 21,\quad 28,\quad 36,\quad x,\ldots$$

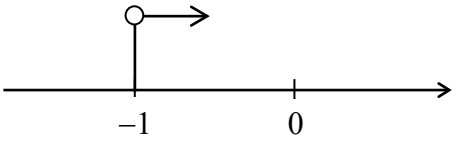
26. Expand $a(a+b+5)$.

27. Expand $(3x-5)^2$.

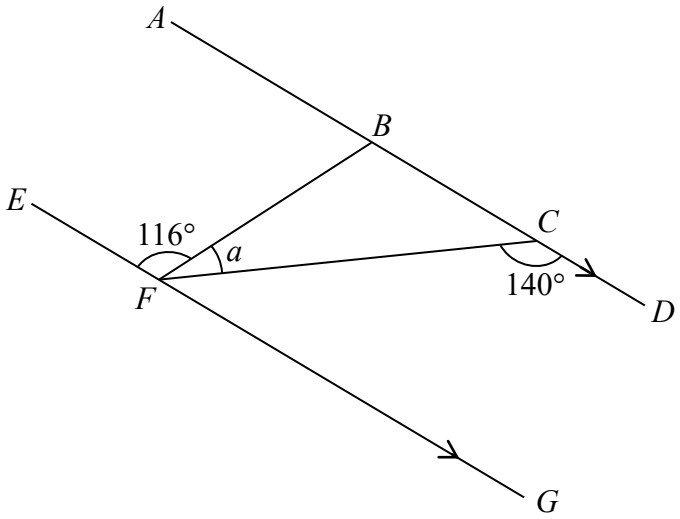
28. Simplify $\frac{4n}{y}\times\frac{y^2}{4}$.

29. Make m the subject of the formula $h=-3m+10$.

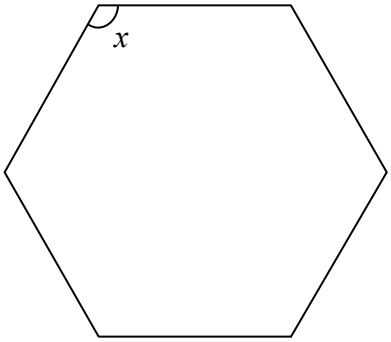
30. According to the diagram, write down an inequality in x .



31. In the figure, $ABCD$ and EFG are a pair of parallel lines. $\angle BFE = 116°$, $\angle DCF = 140°$ and $\angle BFC = a$. Find a .

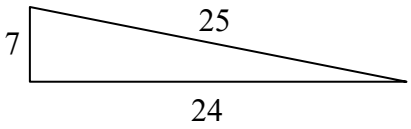


32. The figure shows a right hexagon. Find x .

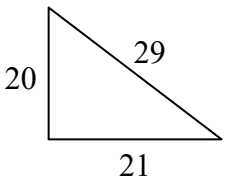


33. Which of the following triangles is/are right-angled? (May be more than one answer)

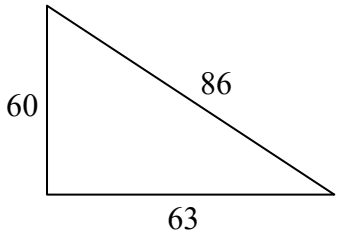
Triangle P



Triangle Q

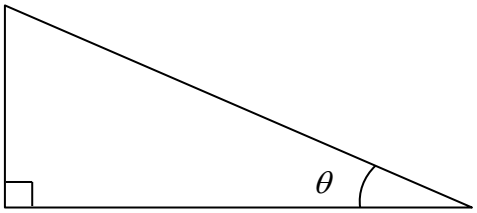


Triangle R



34. Find the distance between two points $M(-3, -16)$ and $N(7, 8)$ in the rectangular coordinate plane.

35. In the figure, $\cos\theta = \frac{11}{13}$. Find θ correct to 3 significant figures.

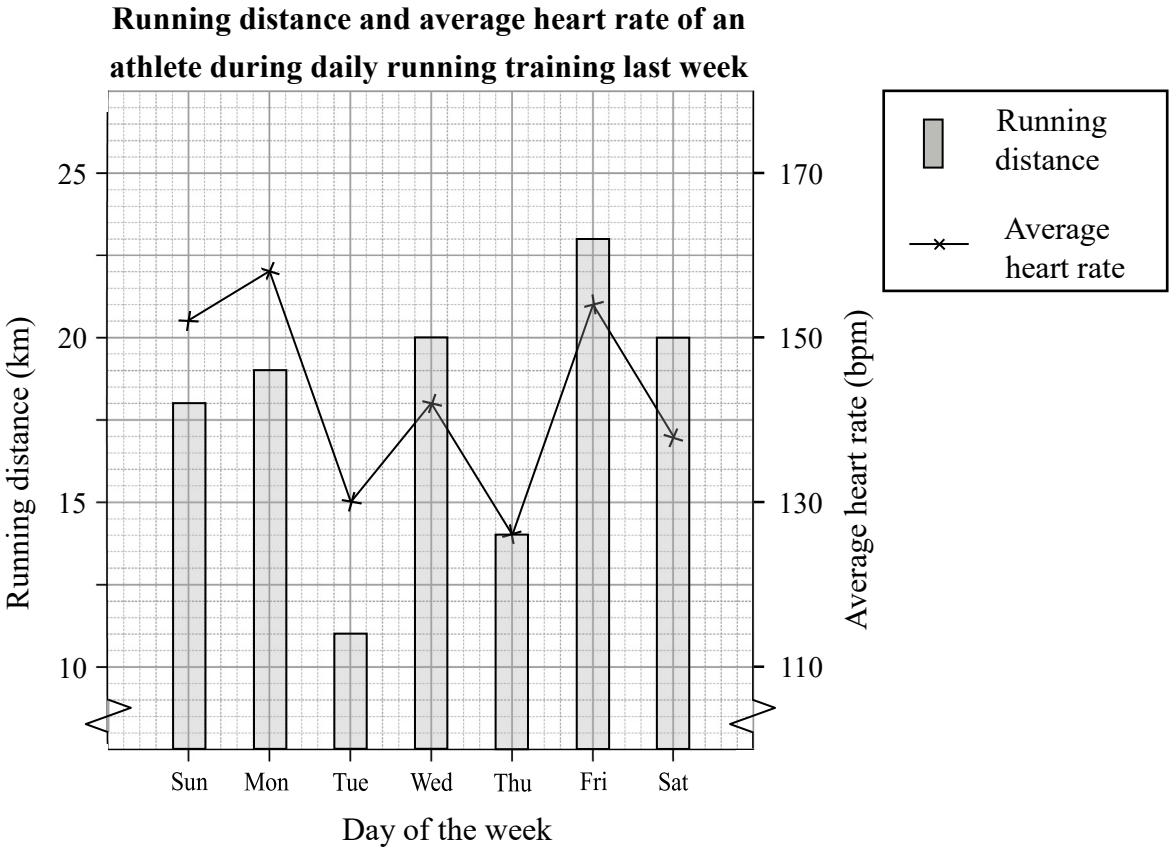


36. The following data shows the completion times (seconds) of 20 students for a mathematics challenge question.

8	15	22	13	35
38	9	16	31	35
27	11	23	38	40
12	20	16	33	26

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

37. The diagram below shows the running distance and average heart rate of an athlete during daily running training last week.



According to the above diagram, answer the following questions.

(a) How many kilometres did the athlete run last week?

(b) If the average heart rate of the athlete during training was 150 bpm or above, the athlete was considered as performing high-intensity training. How many days did the athlete perform high-intensity training last week?

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 table below shows the expenditures of 30 students on online shopping last month.

Expenditure ($)	101 – 150	151 – 200	201 – 250	251 – 300	301 – 350
Frequency	7	6	8	5	4

Find the modal class of the expenditure of 30 students on online shopping last month.

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

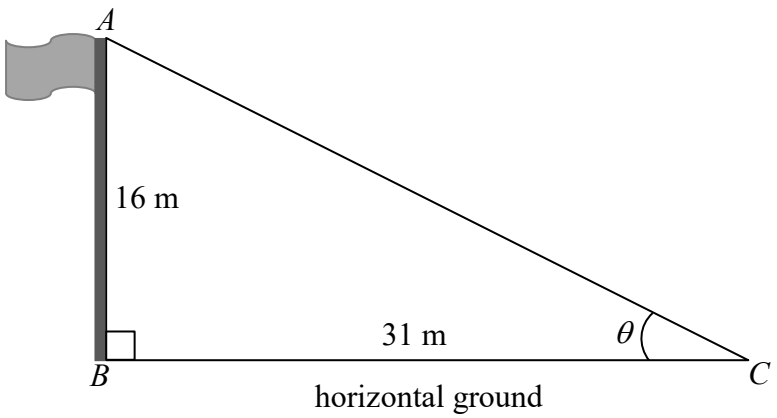
40. Ruby deposits \$20 000 in a bank and the interest rate is 4% p.a. **compounded** yearly. Find the interest she will receive after 2 years.

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

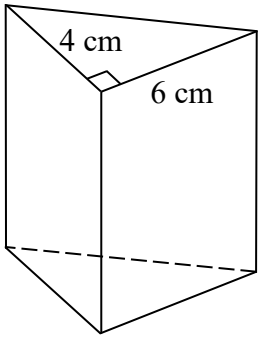
x	-3	0	3
y		-2	

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

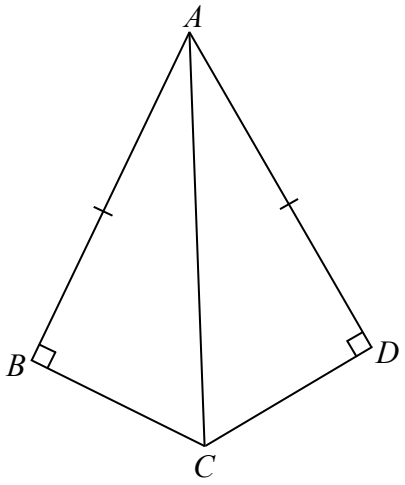
42. In the figure, the height of a vertical flagpole AB is 16 m. B and C are on the horizontal ground, where $BC = 31$ m. Find the angle of elevation θ of A from C correct to 3 significant figures.



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, $\angle ABC = \angle ADC = 90°$ and $AB = AD$. Prove that $\triangle ABC \cong \triangle ADC$.



45. (a) Simplify $(a^3)^4$ and express the answer with positive index.

(b) Simplify $\dfrac{a^{-2}}{(a^3)^4}$ and express the answer with positive index.

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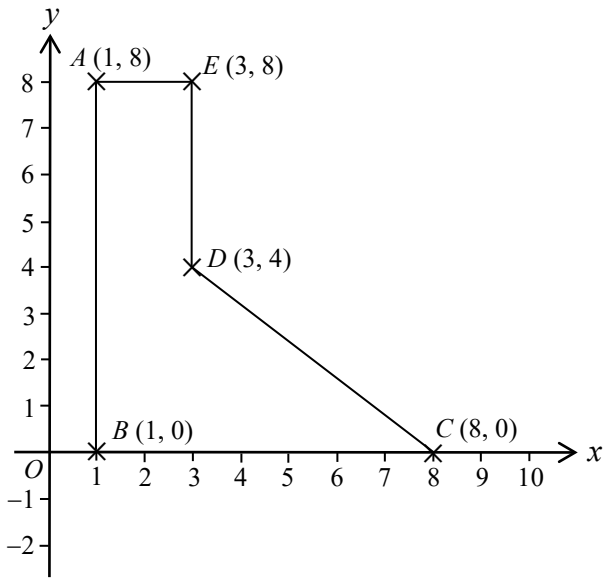
46. Find the area of polygon $ABCDE$ in the figure.



47. A fast-food restaurant offers afternoon tea sets. A customer can choose one food from four options (French toast, hamburger, fried chicken leg and grilled chicken wing) and one drink from two options (coffee and milk tea).

(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) A customer buys an afternoon tea set randomly. Find the probability that the set includes a fried chicken leg.

END OF PAPER

Do not write on this page.

Answers written on this page will not be marked.