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Education Bureau

Territory-wide System Assessment 2023

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 $2^2 \times 3$ and $2 \times 3^2 \times 5$.

A. 2×3

B. $2 \times 3 \times 5$

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

D. $2^3 \times 3^3 \times 5$

2. Michael weighed 100 kg last year. His weight is 110 kg this year. Find the percentage change of his weight.

A. Decreased by 10%

B. Decreased by 9.09%

C. Increased by 9.09%

D. Increased by 10%

3. $x^2 - y^2 =$

A. $2x - 2y$.

B. $x \cdot x - y \cdot y$.

C. $(x - y)^2$.

D. $x \cdot x + y \cdot y$.

4. There are 6 boxes of hand sanitiser. Each box contains x bottles of hand sanitiser. If David buys 3 more bottles of hand sanitiser, all the bottles of hand sanitiser can be divided into 7 sets equally. How many bottles of hand sanitiser are there in each set?

A. $\left(\frac{6x}{7}-3\right)$ bottles

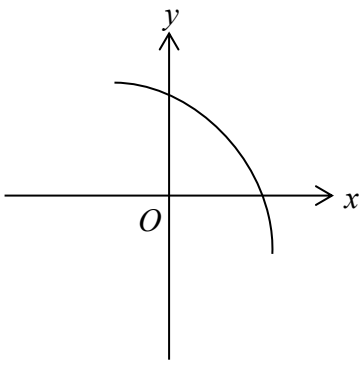
B. $\left(\frac{6x}{7}+3\right)$ bottles

C. $\frac{6x-3}{7}$ bottles

D. $\frac{6x+3}{7}$ bottles

5. Which of the following may represent the graph of the equation $x+y-7=0$?

A.



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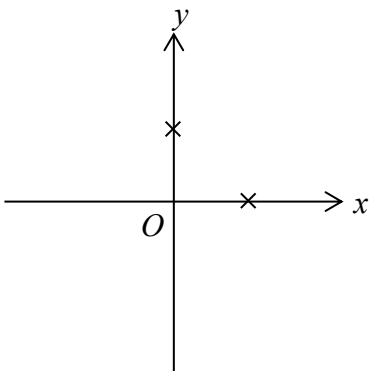
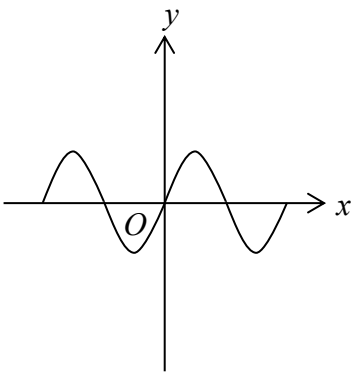


C.



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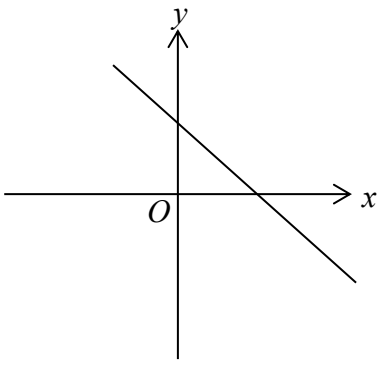

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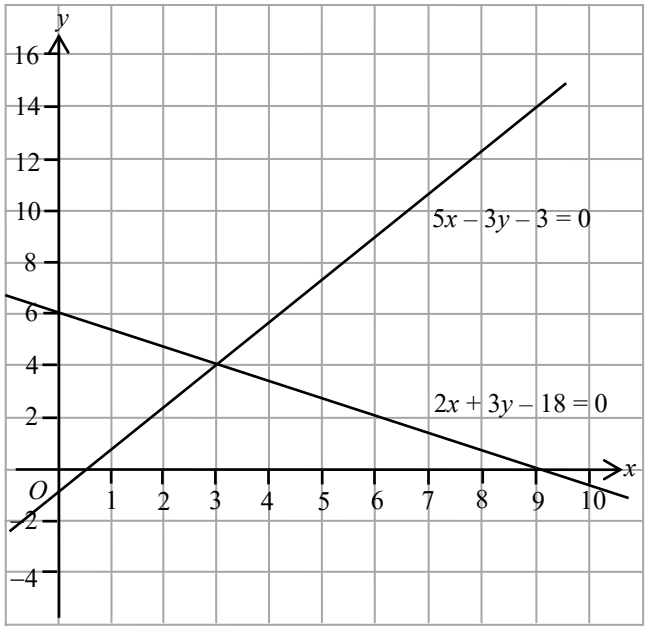


The above figure shows the graphs of $2x + 3y - 18 = 0$ and $5x - 3y - 3 = 0$.

According to the given graphs, solve the simultaneous equations $\begin{cases} 2x+3y-18=0 \\ 5x-3y-3=0 \end{cases}$ graphically.

A. (0, 6)

B. (3, 4)

C. (4, 3)

D. (9, 0)

7. Nancy and Ivan weigh x kg and y kg respectively. Their total weight is 70 kg. 3 times Nancy's weight equals 2 times Ivan's weight. Which of the following pairs of simultaneous equations shows the relation between x and y?

A. $\begin{cases} x+y=70 \\ 2x=3y \end{cases}$

B. $\begin{cases} x+y=70 \\ 3x=2y \end{cases}$

C. $\begin{cases} 2x+3y=70 \\ 2x=3y \end{cases}$

D. $\begin{cases} 3x+2y=70 \\ 3x=2y \end{cases}$

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

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

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

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

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

9. $a\,(3a + b - 1) =$

A. $4a + b - 1$.

B. $4a + ab - a$.

C. $3a^2 + ab - a$.

D. $3a^2 + b - 1$.

10. Which of the following is an identity?

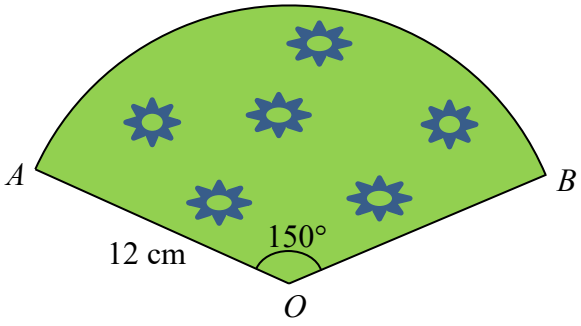
A. $x - 3 = 3 - x$

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

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

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

11. The figure shows a sticker OAB with the shape of a sector. Its radius is 12 cm and $\angle AOB = 150°$. Find the area of the sticker.



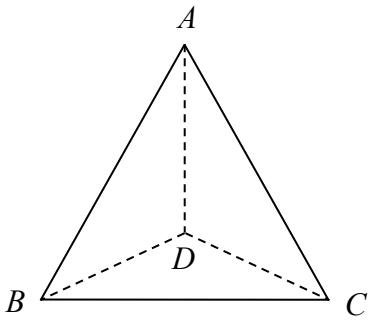
A. $\pi(12)\times\frac{150°}{360°}$ cm^2

B. $2\pi(12)\times\frac{150°}{360°}$ cm^2

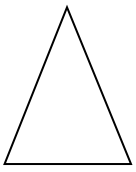
C. $\pi(12)^2\times\frac{150°}{360°}$ cm^2

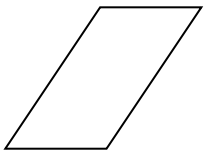
D. $2\pi(12)^2\times\frac{150°}{360°}$ cm^2

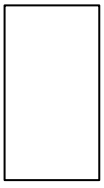
12. A regular tetrahedron is placed horizontally as shown. Raymond sketches a section which is perpendicular to the base and passing through vertex A.

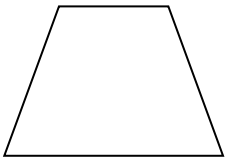


Which of the following can be the plane diagram of the section?

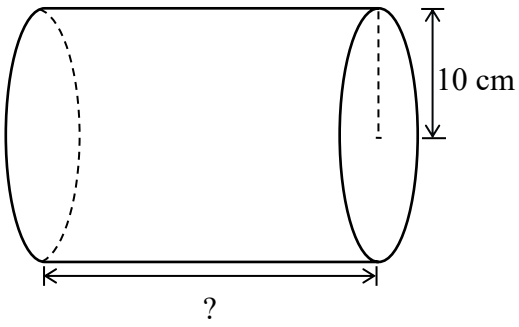
A. 

B. 

C. 

D. 

13. The figure shows a solid right circular cylinder. Its curved surface area is $500\pi \text{ cm}^2$. Its base radius is 10 cm. Find the height of the cylinder.



A. 5 cm

B. 15 cm

C. 25 cm

D. 50 cm

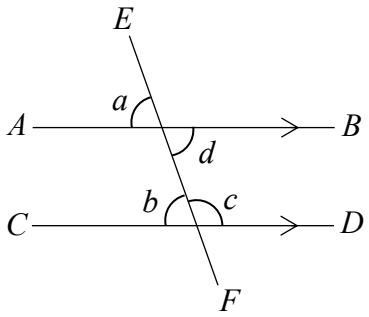
14. In the figure, AB // CD and EF is a straight line. Which of the following are a pair of corresponding angles?

A. a and b

B. a and d

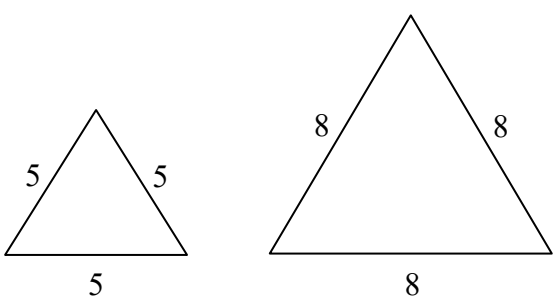
C. c and b

D. c and d

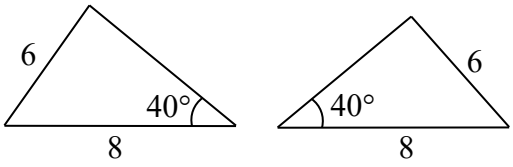


15. Which of the following pairs of triangles **MUST** be congruent?

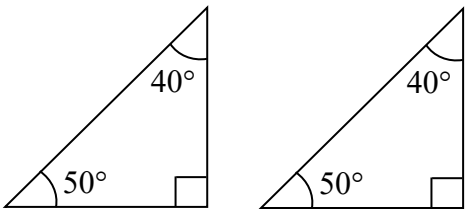
A.



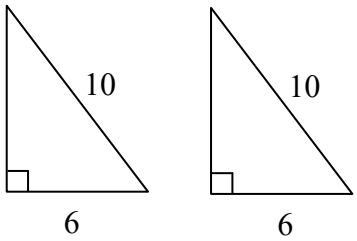
B.



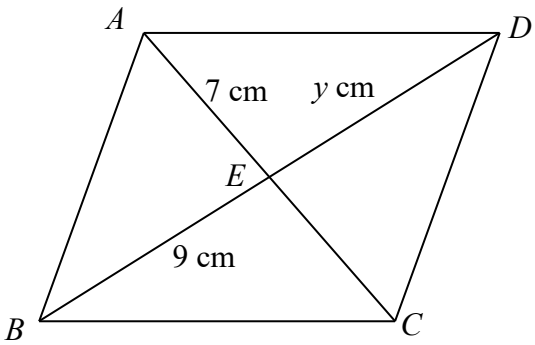
C.



D.



16. In the figure, $ABCD$ is a parallelogram. AC and BD intersect at point E. $AE = 7$ cm, $BE = 9$ cm and $DE = y$ cm. Find the value of y.



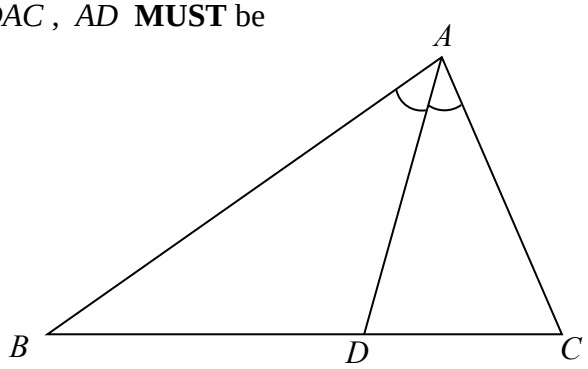
A. 2

B. 7

C. 9

D. 16

17. In $\triangle ABC$, BDC is a straight line. If $\angle BAD = \angle DAC$, AD **MUST** be



A. an angle bisector of $\triangle ABC$.

B. a median of $\triangle ABC$.

C. an altitude of $\triangle ABC$.

D. a perpendicular bisector of $\triangle ABC$.

18. P (9, 0) and Q (–3, 2) are two points on a straight line L in the rectangular coordinate plane. The slope of L =

A. $\frac{2-0}{-3-9}$.

B. $\frac{-3-9}{2-0}$.

C. $\frac{2+0}{-3+9}$.

D. $\frac{-3+9}{2+0}$.

19. The table below shows the water consumption (m^3) of a restaurant last week.

Day of the Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Water Consumption (m^3)	30.0	30.1	28.1	31.2	34.8	39.6	42.0

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

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

20. Carmen applied for admission to a secondary school. The table below shows the weights of the admission criterion and her marks in these areas.

	Admission Criterion		
	Interview	Learning Portfolio	Extra-Curricular Activity
Mark	70	80	90
Weight	5	3	2

Find the weighted mean mark of Carmen.

A. 24
B. 77
C. 80
D. 240

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

21. Express 45 as a product of prime factors.

22. Brian used directed numbers to represent the time differences between Hong Kong and other regions.
For example,
-5 hours represents that the local time in region A is 5 hours behind the local time in Hong Kong.

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

(i) The local time in Seoul is 1 hour ahead of the local time in Hong Kong.
(ii) The local time in New York is 12 hours behind the local time in Hong Kong.

23. If $\sqrt[3]{a} = 8$, find the value of a.

24. Solve the equation $2(x - 3) - 7 = 8 - 5x$.

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

(i) The selling price of an apple is $\$3$. Mary pays $\$y$ to buy x apples.
(ii) A teacher shares 30 candies between x students equally. Each student gets y candies.

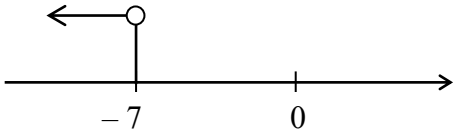
26. Factorise $x^2 + 12x + 36$.

27. Expand $(x - 1)(x + 5)$.

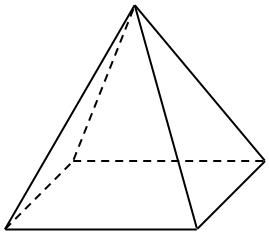
28. Factorise $x^2 - 7x + 6$.

29. Simplify $\frac{1}{2x} + \frac{2}{x}$.

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

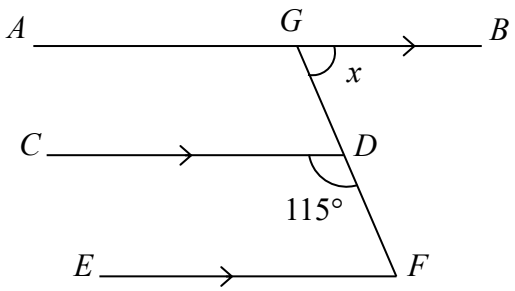


31. The figure shows the diagram of a right pyramid:

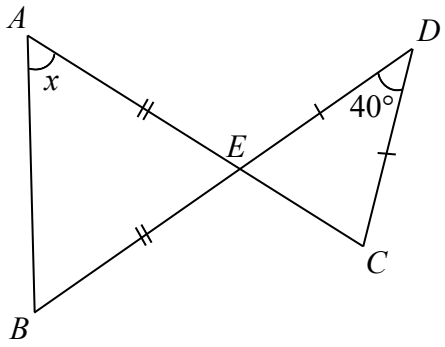


Referring to the sketch shown above, add 1 solid line and 1 dotted line in the figure provided in the **ANSWER BOOKLET** so as to form a diagram of a **right hexagonal prism**.

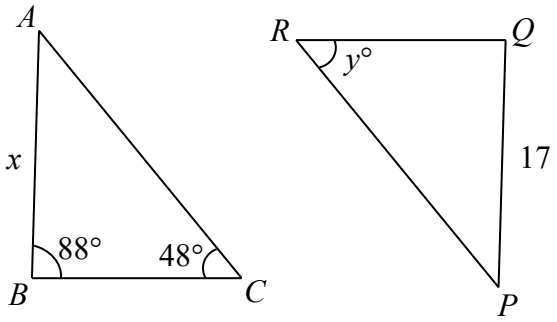
32. In the figure, AGB and GDF are straight lines. AB , CD and EF are parallel lines. It is given that $\angle CDF = 115°$. Find x .



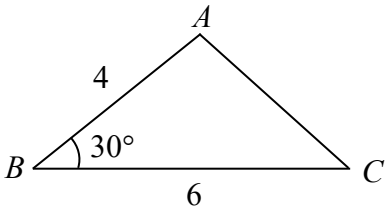
33. In the figure, AEC and DEB are straight lines. $\triangle EAB$ and $\triangle DEC$ are isosceles triangles, where $EA = EB$ and $DC = DE$. It is given that $\angle CDE = 40°$. Find x.



34. In the figure, $\triangle ABC \cong \triangle PQR$. Find
    (a) the value of x,
    (b) the value of y.

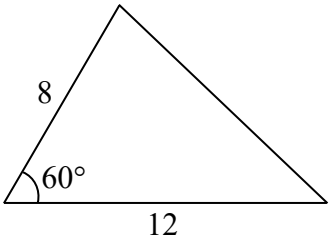


35.

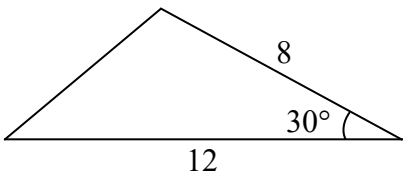


Which of the following triangles **MUST** be similar to $\triangle ABC$ as shown in the above figure? (May be more than one answer)

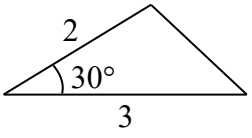
Triangle P



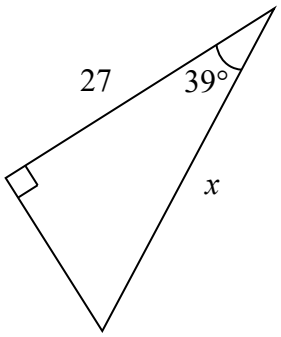
Triangle Q



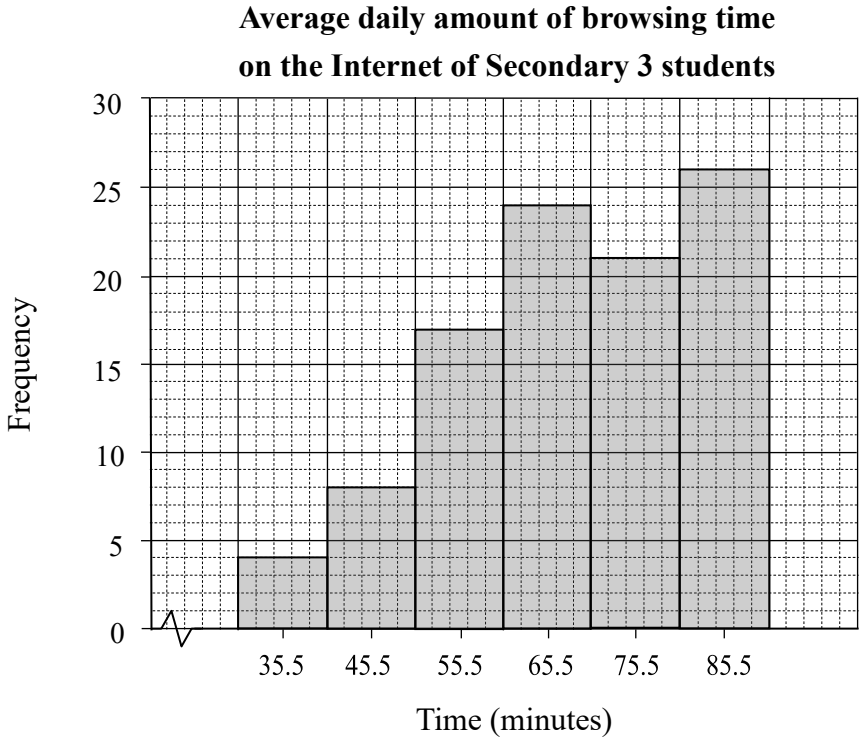
Triangle R



36. Find the value of x in the figure. (Correct to 3 significant figures)



37. The histogram below shows the average daily amount of browsing time on the Internet of Secondary 3 students in a school.



According to the above histogram, answer the following questions.

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

(b) Find the total number of Secondary 3 students in the school.

(c) If a student's average daily amount of browsing time on the Internet is 60.5 minutes or more, he/she has to join an activity called "Master of Time Management". Find the number of Secondary 3 students joining the activity.

38. The following data shows the number of homework submitted late by Jason in the last 8 months.

13, 3, 5, 9, 12, 12, 13, 13

Find the mean and the median of the above data.

39. Wilson throws a dice 100 times. The outcomes are shown as follows:

Outcome	1	2	3	4	5	6
Frequency	12	20	14	28	14	12

Find the relative frequency of Wilson getting an even number.

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. Paul deposits \$5 720 in a bank at a **simple interest rate** of 3% p.a. Find the interest he will receive after 5 years.

41. In a city, 2 000 people got influenza three months ago. If the number of infected people is decreasing by 30% monthly, find the number of people getting influenza in the city this month.

Go on to the next page

42. Complete the table for the equation $y = 2x + 1$ in the **ANSWER BOOKLET**.

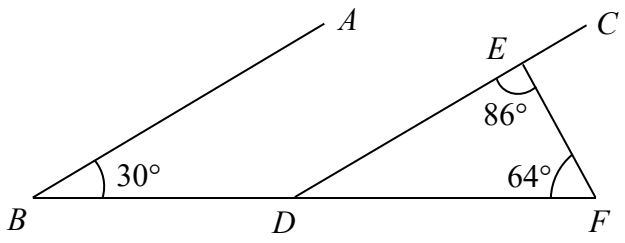
x	–3	0	2
y		1	

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

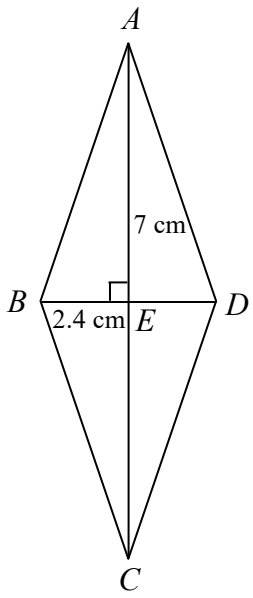
43. (a) Simplify $x^{-4} \cdot x^{6}$ and express the answer with positive index.

(b) Simplify $(x^{-4} \cdot x^{6})^{5}$ and express the answer with positive index.

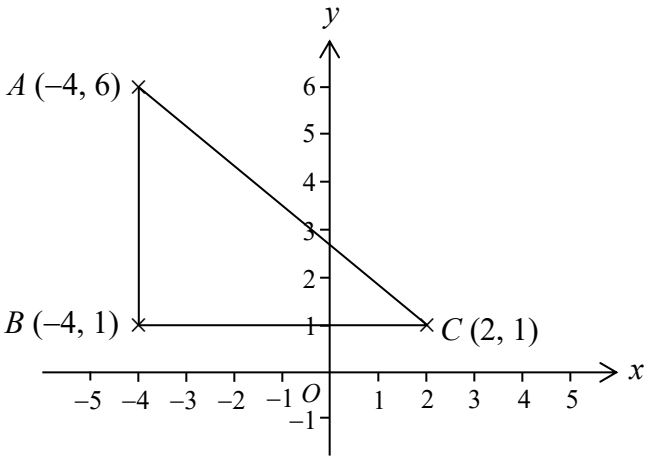
44. In the figure, BDF and CED are straight lines. It is given that $\angle ABD = 30°$, $\angle DEF = 86°$ and $\angle EFD = 64°$. Prove that $AB \,//\, CD$.



45. In the figure, $ABCD$ is a rhombus. AC and BD are perpendicular to each other and they intersect at point E. It is given that $AE = 7$ cm and $BE = 2.4$ cm. Find the perimeter of the rhombus.



46. Find the area of $\triangle ABC$ in the figure.



47. The prices of drinks at a restaurant are shown as follows:

Drink	**Price**
Green Tea	$14
Red Tea	$14
Lemon Water	$16
Lemon Tea	$16
Coffee	$17
Milk Tea	$17
Chocolate Milk	$24
Fresh Milk	$26

A customer said, 'Since the mean price of all types of drinks is $18 , over half of the types of drinks are $18 or more.'
Do you agree with the customer's claim? Explain your answer.

END OF PAPER

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Answers written on this page will not be marked.

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Education Bureau
Territory-wide System Assessment 2023
Secondary 3 Mathematics
ANSWER BOOKLET

INSTRUCTIONS

1. Write your School Code, Class and Class Number in the boxes provided on this page.
2. Stick barcode labels in the spaces provided on page 1 and page 3.
3. Time allowed is 65 minutes.
4. Write ALL your answers in the spaces provided in this ANSWER BOOKLET.
5. Do not write in the margins.
6. Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.
7. The use of HKEAA approved calculators is permitted.
8. Rough work should be done on the rough work sheet provided.

School Code	S				Class	3		Class No.		

Write one capital letter in this box.

SECTION A: Multiple Choice Questions

MC Questions – Blacken the circle under the correct answer with an **HB pencil**. For example :

A	B	C	D
●	○	○	○

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○

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Please do not write in the margin.

Please stick the barcode label in the box. →

	A	B	C	D
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

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SECTION B: Write your answers in the spaces provided. Working need not be shown.

21. _____

22. (i) _____ hour(s) represents that the local time in Seoul is 1 hour ahead of the local time in Hong Kong.

(ii) _____ hour(s) represents that the local time in New York is 12 hours behind the local time in Hong Kong.

23. a = _____

24. x = _____

25. *Circle the correct answer (i) * Direct proportion / Inverse proportion

(ii) * Direct proportion / Inverse proportion

26. _____

27. _____

28. _____

29. _____

30. _____

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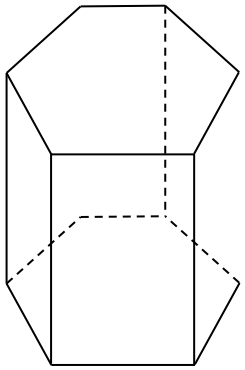
31. Diagram of a right hexagonal prism:



32. $x =$ _____

33. $x =$ _____

34. (a) $x =$ _____

(b) $y =$ _____

35. _____

36. $x =$ _____

37. (a)

Time (minutes)	31 – 40	41 – 50	51 – 60	61 – 70	71 – 80	81 – 90
Frequency	4		17		21	

(b) The total number of Secondary 3 students in the school is _____ .

(c) The number of Secondary 3 students joining the activity is _____ .

38. Mean = _____

Median = _____

39. The required relative frequency = _____

Please do not write in the margin.

Please do not write in the margin.

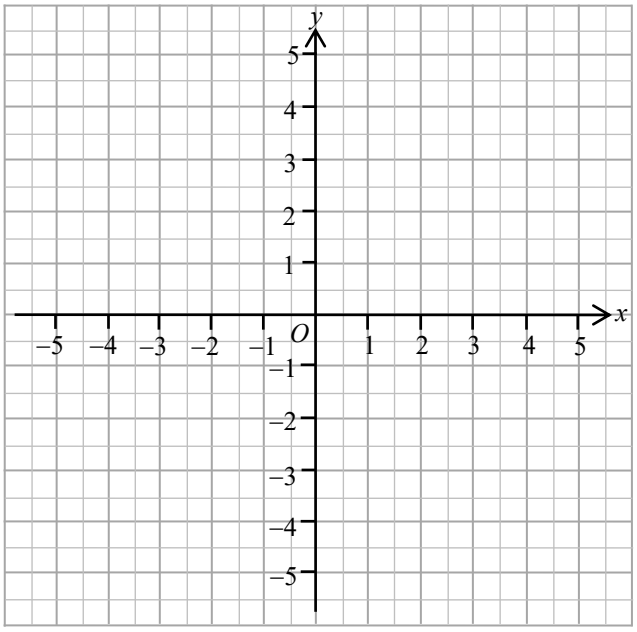
SECTION C: Answer in the spaces provided.
All working and conclusions must be clearly shown.

40.

41.

42. $y = 2x + 1$

x	– 3	0	2
y		1	



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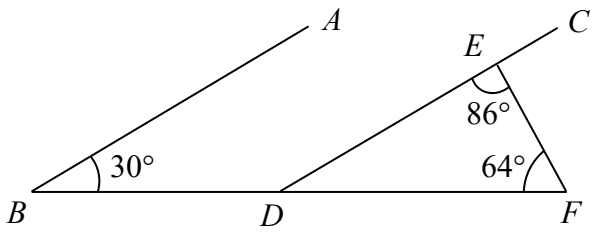
43.

44.



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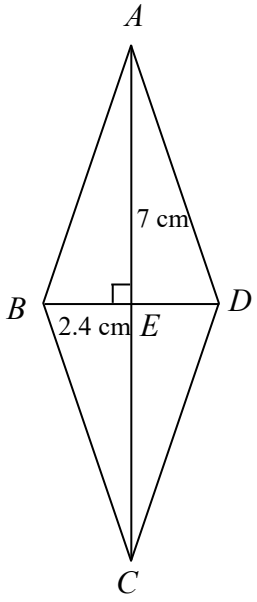
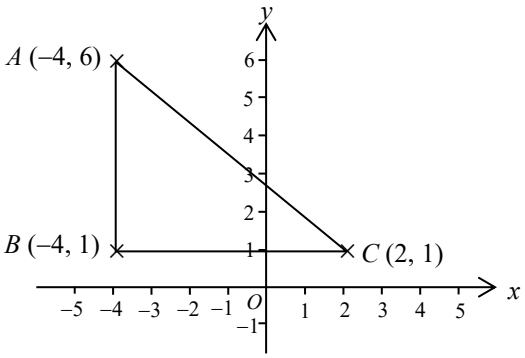
45.



46.



47. Reason:

∴ I * **agree** ／ **disagree** with the customer's claim. (*Circle the correct answer)

END OF PAPER

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Prepared by the Hong Kong Examinations and Assessment Authority

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Education Bureau

Territory-wide System Assessment 2023

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. Round off 0.069 87 to 3 decimal places.

A. 0.069

B. 0.069 9

C. 0.07

D. 0.070

2. Which of the following is an irrational number?

A. 0.14

B. $\sqrt[3]{27}$

C. 2π

D. $\frac{1}{3}$

3. Which of the following statements is correct?

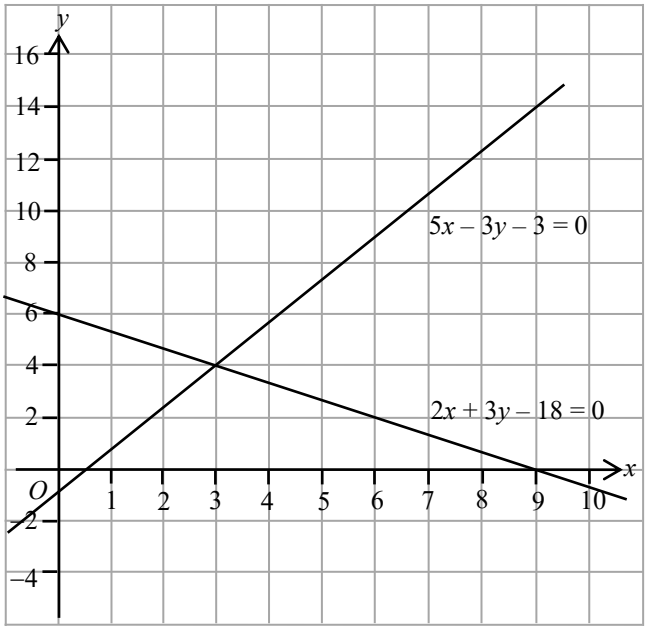
A. The solution of $x-8=0$ is $-\frac{1}{8}$.

B. The solution of $x+8=0$ is $-\frac{1}{8}$.

C. The solution of $8x-1=0$ is $-\frac{1}{8}$.

D. The solution of $8x+1=0$ is $-\frac{1}{8}$.

4.



The above figure shows the graphs of $2x+3y-18=0$ and $5x-3y-3=0$.

According to the given graphs, solve the simultaneous equations $\begin{cases}2x+3y-18=0\\5x-3y-3=0\end{cases}$ graphically.

A. (0, 6)

B. (3, 4)

C. (4, 3)

D. (9, 0)

5. $(-4)^{-3} =$

A. -64.

B. 64.

C. $-\frac{1}{64}$.

D. $\frac{1}{64}$.

6. $1.86 \times 10^3 =$

A. 1 860 .

B. 186 000 .

C. 0.001 86 .

D. 0.000 186 .

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

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

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

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

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

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

(i)	$(2x - 1)(x - 1)(x - 3)$ $= 2x^3 - 9x^2 + 10x - 3$	(ii)	$2x^3 - 9x^2 + 10x - 3$ $= (2x - 1)(x - 1)(x - 3)$

A. (i) Factorisation (ii) Factorisation

B. (i) Expansion (ii) Factorisation

C. (i) Factorisation (ii) Expansion

D. (i) Expansion (ii) Expansion

9. If $x \geq -3$, which of the following **CANNOT** be the value of x ?

A. 0

B. –2

C. –3

D. –4

10. A shop sells two kinds of candies including lollipops and chocolate. One pack of lollipops weighs x g. The weight of a pack of chocolate is half that of a pack of lollipops. Susan has 3 packs of lollipops and 4 packs of chocolate. The total weight of the candies does not exceed 750 g. Which of the following inequalities can be used to find the range of the values of x ?

A. $3x + 4 \times \left(\frac{x}{2}\right) > 750$

B. $3x + 4 \times \left(\frac{x}{2}\right) < 750$

C. $3x + 4 \times \left(\frac{x}{2}\right) \geq 750$

D. $3x + 4 \times \left(\frac{x}{2}\right) \leq 750$

11. The thickness of a glass is 6 mm (correct to the nearest mm). Which of the following could be its actual thickness?

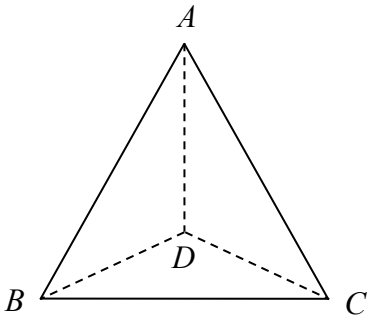
A. 5.3 mm

B. 5.4 mm

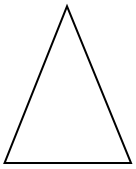
C. 6.4 mm

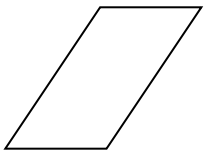
D. 6.5 mm

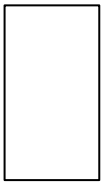
12. A regular tetrahedron is placed horizontally as shown. Raymond sketches a section which is perpendicular to the base and passing through vertex A.

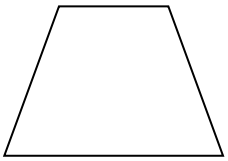


Which of the following can be the plane diagram of the section?

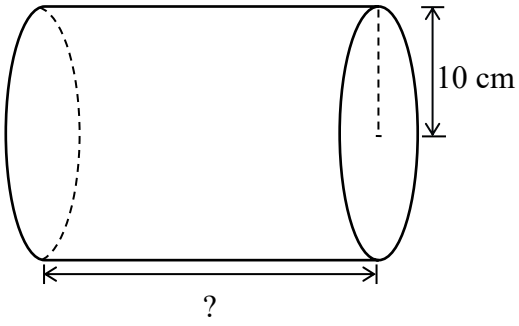
A. 

B. 

C. 

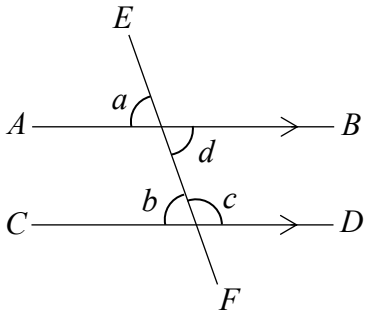
D. 

13. The figure shows a solid right circular cylinder. Its curved surface area is 500π cm^2. Its base radius is 10 cm. Find the height of the cylinder.



A. 5 cm
B. 15 cm
C. 25 cm
D. 50 cm

14. In the figure, AB // CD and EF is a straight line. Which of the following are a pair of corresponding angles?



A. a and b

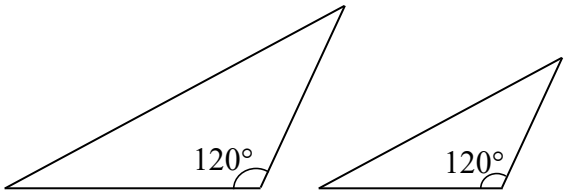
B. a and d

C. c and b

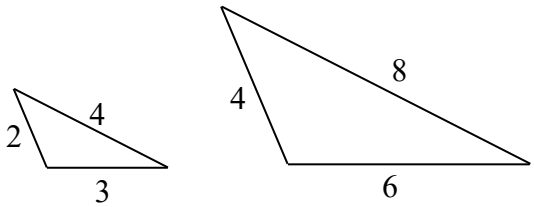
D. c and d

15. Which of the following pairs of triangles **MUST** be similar?

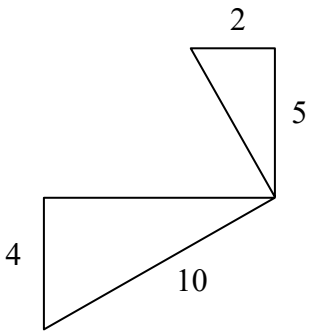
A.



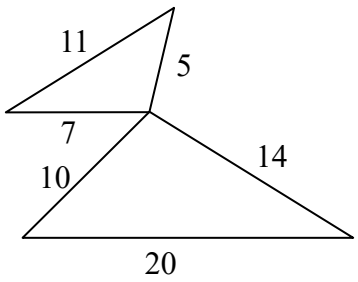
B.



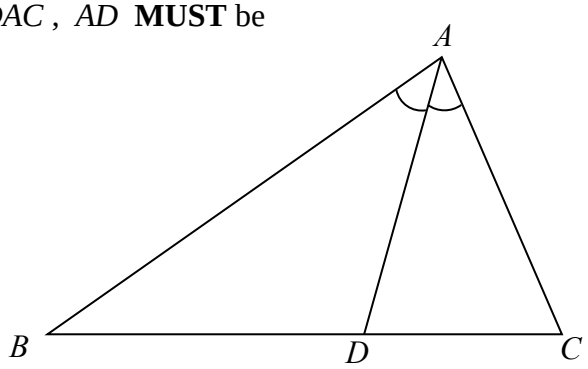
C.



D.



16. In $\triangle ABC$, BDC is a straight line. If $\angle BAD = \angle DAC$, AD **MUST** be



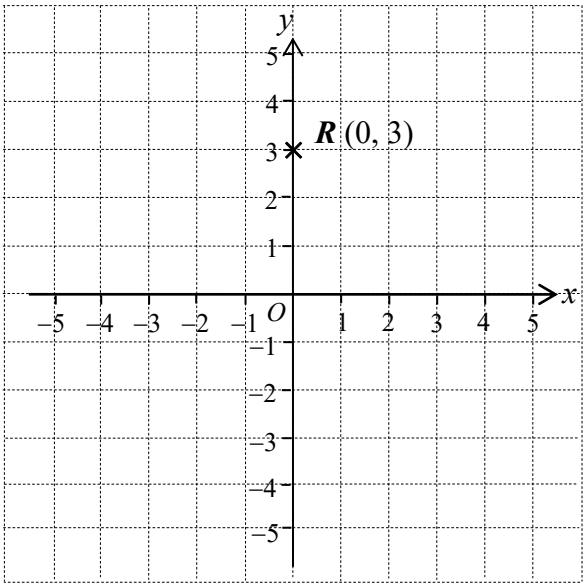
A. an angle bisector of $\triangle ABC$.

B. a median of $\triangle ABC$.

C. an altitude of $\triangle ABC$.

D. a perpendicular bisector of $\triangle ABC$.

17. In the figure, $\boldsymbol{R}$ (0, 3) is rotated about the origin O through 90° in a clockwise direction to $\boldsymbol{R'}$. Find the coordinates of $\boldsymbol{R'}$.



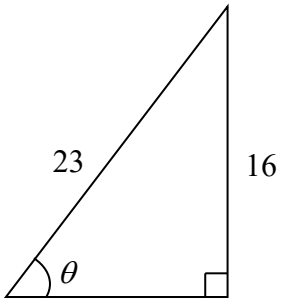
A. (0, −3)

B. (−3, 0)

C. (3, 0)

D. (0, 3)

18. Referring to the figure, find θ. (Correct to 3 significant figures)



A. 34.8°

B. 44.1°

C. 45.9°

D. 55.2°

19. The table below shows the water consumption (m^3) of a restaurant last week.

Day of the Week	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Water Consumption (m^3)	30.0	30.1	28.1	31.2	34.8	39.6	42.0

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

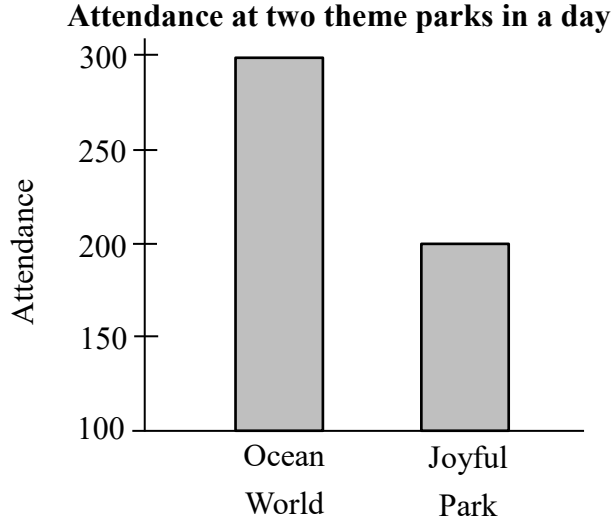
A. Pie chart

B. Broken line graph

C. Stem-and-leaf diagram

D. Histogram

20. The diagram below shows the attendance at two theme parks in a day.



Based on the diagram above, Charles believes that the attendance at "Ocean World" is double the attendance at "Joyful Park" on that day.
Which of the following statements is the best reason that Charles is **misled** by the above diagram?

A. The scale of vertical axis in the diagram does not start from 0 .

B. The number of days the two theme parks were open is not shown.

C. The attendance on other days is not shown.

D. The number of staff at the two theme parks is not shown.

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

21. Calculate $6 \times [4 + (7 - 10 \div 2)]$.

22. Calculate $\dfrac{(-5)(-3)}{-2-3}$.

23. Calculate $\sqrt[3]{1728}$.

24. The electricity consumption of a company was 1 140 kWh last month. It decreased by 15% this month. Find the electricity consumption of the company this month.

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

1, 3, 6, 10, 15, 21, 28, x, ...

26. Solve the equation $2(x - 3) - 7 = 8 - 5x$.

27. Find the coefficient of x^2 in the polynomial of $5x^3 - 7x^2 + 6x - 9$.

28. Factorise $5(x + y) - a(x + y)$.

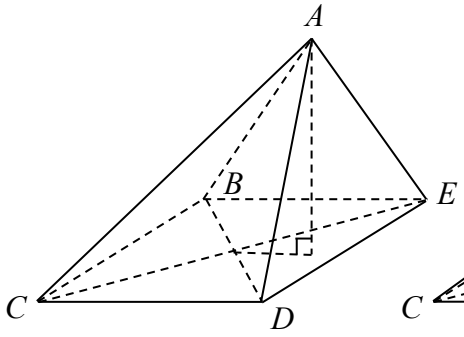
29. Expand $(y - 4)^2$.

30. Simplify $\left(\frac{x^2}{8y}\right)\left(\frac{16y}{x}\right)$.

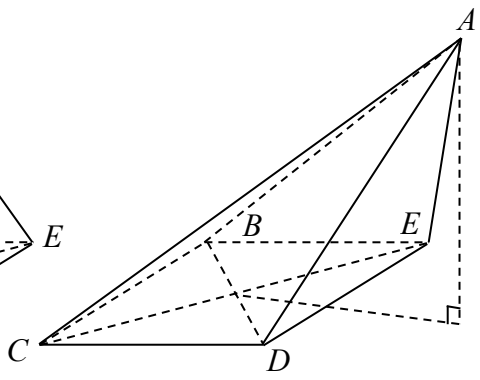
31. Make y the subject of the formula $w = k + \frac{y}{5}$.

32. In each of the following solids, their bases $BCDE$ are squares. Which of the following **MUST** be a right pyramid?

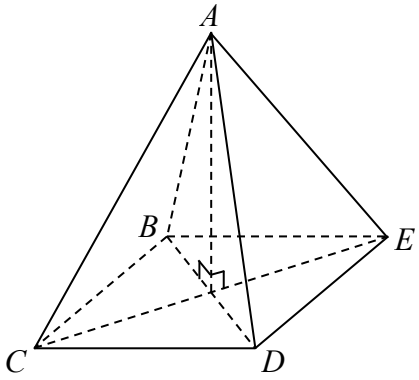
Solid P



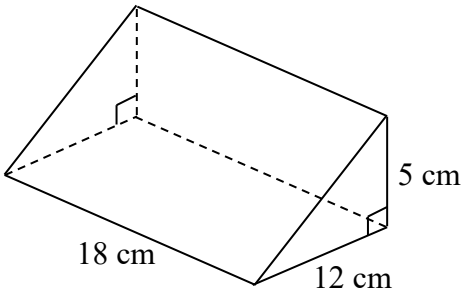
Solid Q



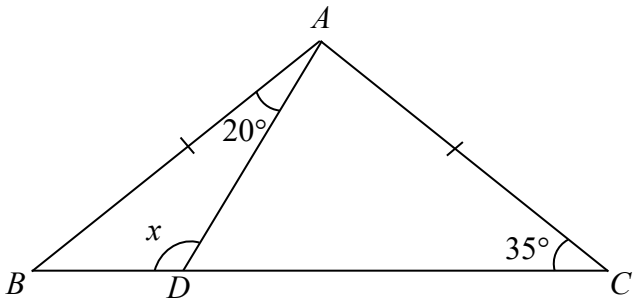
Solid R



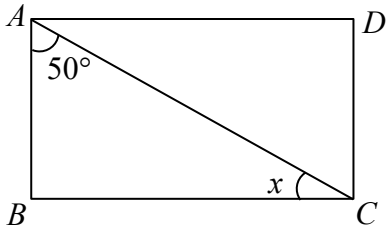
33. In the figure, the base of the prism is a right-angled triangle. The base and the height of the right-angled triangle are 12 cm and 5 cm respectively. The height of the prism is 18 cm. Find the volume of the prism.



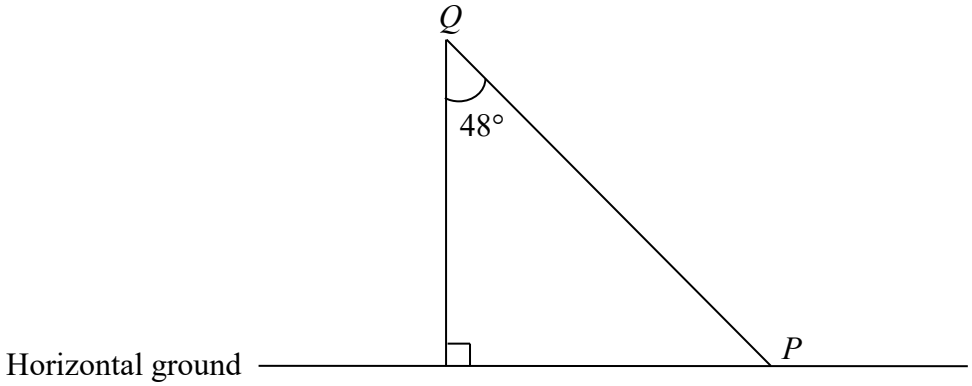
34. In the figure, BDC is a straight line. $\triangle ABC$ is an isosceles triangle, where $AB = AC$. It is given that $\angle ACD = 35°$ and $\angle BAD = 20°$. Find x.



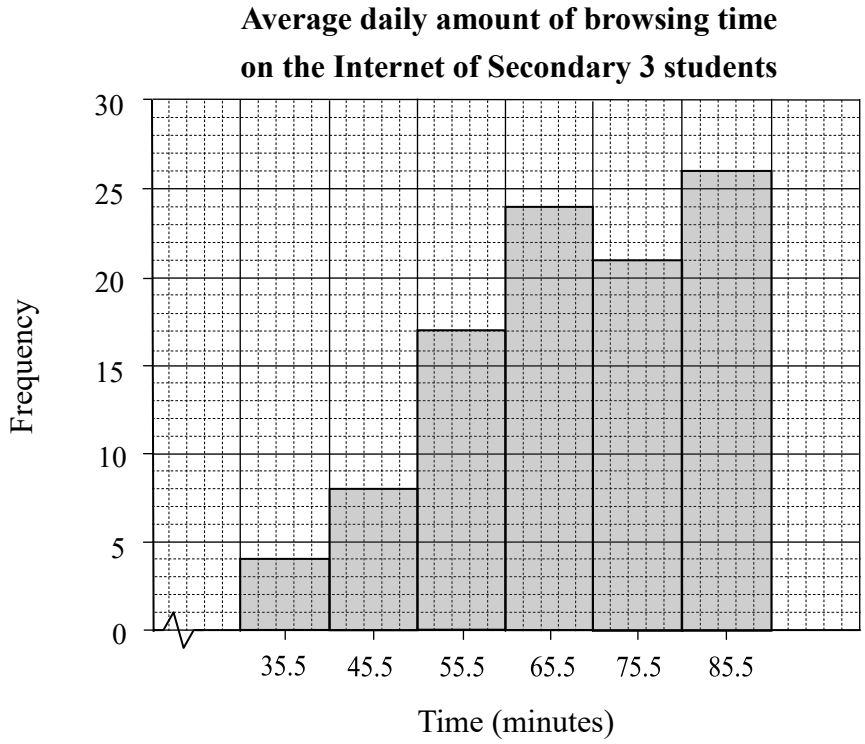
35. In the figure, AC is the diagonal of rectangle $ABCD$. It is given that $\angle BAC = 50°$. Find x.



36. In the figure, P is a point on the horizontal ground. Find the angle of elevation of Q from P.



37. The histogram below shows the average daily amount of browsing time on the Internet of Secondary 3 students in a school.



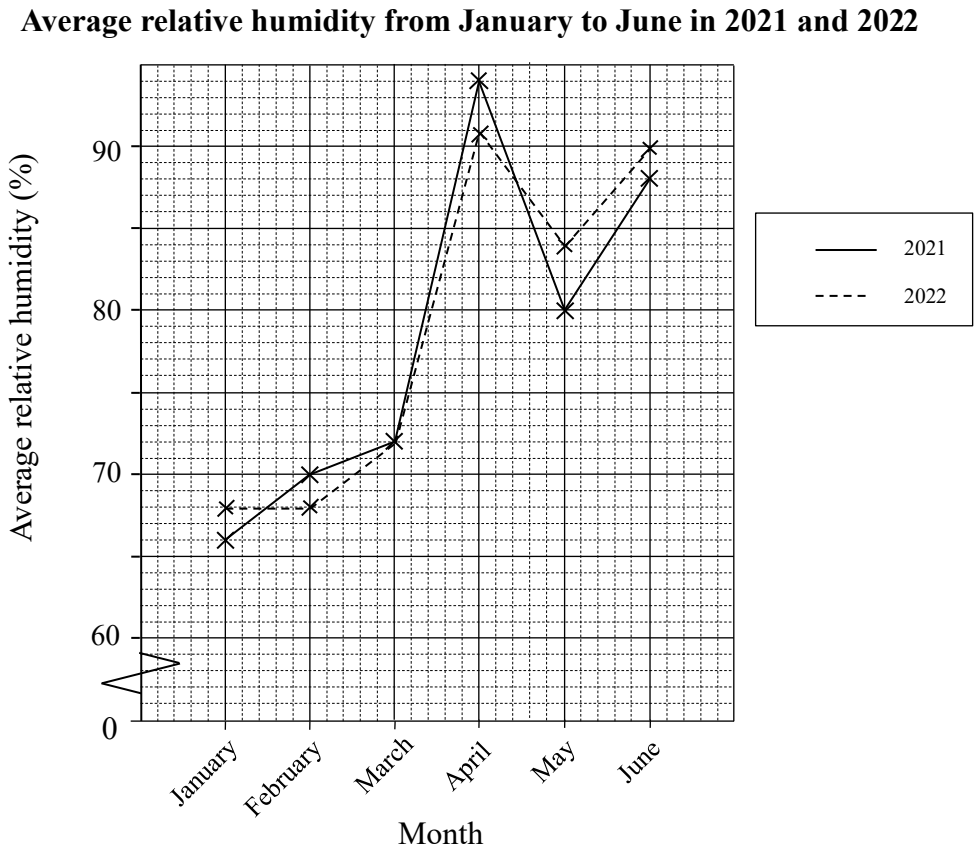
According to the above histogram, answer the following questions.

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

(b) Find the total number of Secondary 3 students in the school.

(c) If a student's average daily amount of browsing time on the Internet is 60.5 minutes or more, he/she has to join an activity called "Master of Time Management". Find the number of Secondary 3 students joining the activity.

38. The diagram below shows the average relative humidity from January to June in 2021 and 2022.



According to the above diagram, in which month is the average relative humidity the same in 2021 and 2022 ?

39. The following data shows the number of homework submitted late by Jason in the last 8 months.

13, 3, 5, 9, 12, 12, 13, 13

Find the mean and the median of the above data.

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

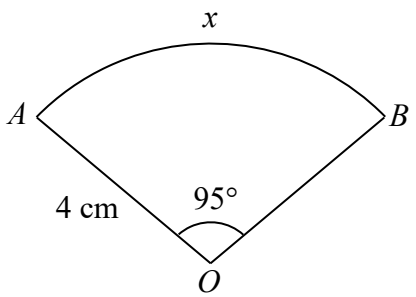
40. It is recommended that the standard daily calorie intake of a male adult should not exceed 2 500 calories. Mr Chan ate instant noodles, pizza and roast goose today. The calories are 381, 532 and 1 706 respectively.

Based on the description above, give an appropriate approximation for each **UNDERLINED VALUE**. Hence, estimate the total calorie intake of Mr Chan today. Briefly explain whether his calorie intake today is over the standard.

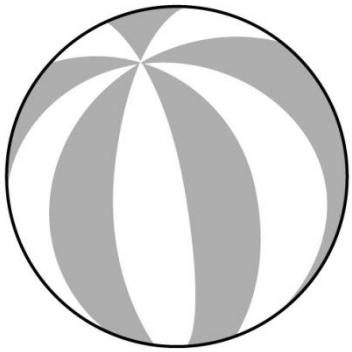
41. There is a box of facemasks. If it is distributed to 4 persons, each person can get 15 facemasks. If this box of facemasks is distributed to 6 persons equally, how many facemasks can each person get?

42. Solve the simultaneous equations $\begin{cases} y = 3x + 8 \\ x + y = 4 \end{cases}$.

43. In the figure, the radius of sector OAB is 4 cm and $\angle AOB = 95°$. Let x be the arc length of the sector, find x. Give the answer correct to 3 significant figures.



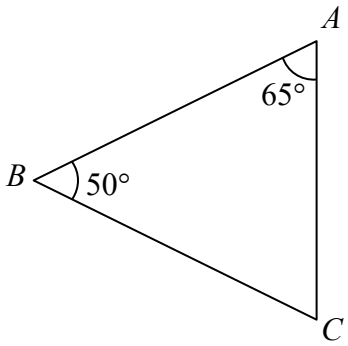
44. In the figure, Ball A and Ball B are similar solids. The diameter of Ball A is 3 times that of Ball B. The volume of Ball A is 2 700 cm^3. Find the volume of Ball B.



Ball A

Ball B

45. In the figure, $\angle ABC = 50°$ and $\angle CAB = 65°$. Prove that $\triangle BCA$ is an isosceles triangle.



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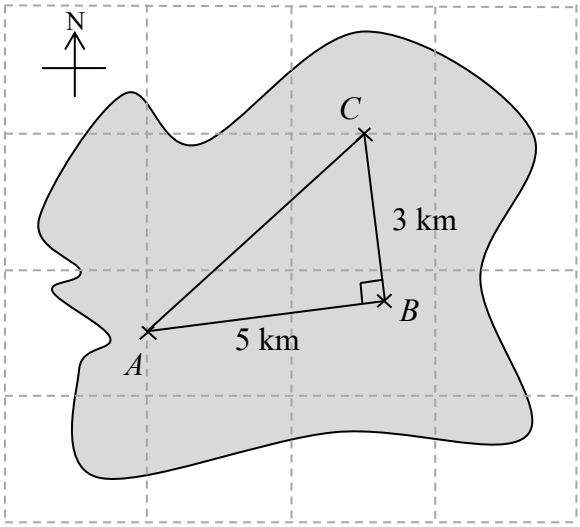
46. The figure shows a map of an orienteering competition. It is given that the distance of AB is 5 km and the distance of BC is 3 km .
Find $\angle ACB$. Give the answer correct to 3 significant figures.



47. The following data shows the number of absentees of a secondary school in the last 15 school days.

9	12	17	18	20
15	8	25	14	30
42	36	7	22	15

Complete the stem-and-leaf diagram in the **ANSWER BOOKLET** to represent the above data.

END OF PAPER

Do not write on this page.

Answers written on this page will not be marked.

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* 9 M E 2 *

9	M	E	2	(	A	)

Please stick the barcode label in the box.

Education Bureau
Territory-wide System Assessment 2023
Secondary 3 Mathematics
ANSWER BOOKLET

INSTRUCTIONS

1. Write your School Code, Class and Class Number in the boxes provided on this page.
2. Stick barcode labels in the spaces provided on page 1 and page 3.
3. Time allowed is 65 minutes.
4. Write ALL your answers in the spaces provided in this ANSWER BOOKLET.
5. Do not write in the margins.
6. Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.
7. The use of HKEAA approved calculators is permitted.
8. Rough work should be done on the rough work sheet provided.

School Code | S | | | |

Class | 3 | |

Class No. | | |

Write one capital letter in this box.

SECTION A: Multiple Choice Questions

MC Questions – Blacken the circle under the correct answer with an **HB pencil**. For example :

A	B	C	D
●	○	○	○

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○

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Please stick the barcode label in the box. →

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	A	B	C	D
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

SECTION B: Write your answers in the spaces provided. Working need not be shown.

21. _____

22. _____

23. _____

24. The electricity consumption of the company is _____ this month.

25. $x =$ _____

26. $x =$ _____

27. The coefficient of x^2 is _____ .

28. _____

29. _____

30. _____

31. _____

32. _____

33. The volume of the prism is _____ .

Please do not write in the margin.

Please do not write in the margin.

34. $x =$ _____

35. $x =$ _____

36. The angle of elevation of Q from P is _____.

37. (a)

Time (minutes)	31 – 40	41 – 50	51 – 60	61 – 70	71 – 80	81 – 90
Frequency	4		17		21	

(b) The total number of Secondary 3 students in the school is _____ .

(c) The number of Secondary 3 students joining the activity is _____ .

38. In 2021 and 2022, the average relative humidity in _____ is the same.

39. Mean = _____

Median = _____

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Please do not write in the margin.

Go on to the next page

SECTION C: Answer in the spaces provided.
All working and conclusions must be clearly shown.

40.

∴ Mr Chan's calorie intake today is *** over** / **not over** the standard.
(*Circle the correct answer)

41.

42.

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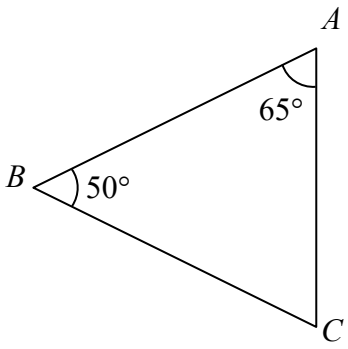
43.

44.

45.



46.

47.

Number of absentees in the last 15 school days

Stem (10)	Leaf (1)
0	
1	
2	
3	
4	

END OF PAPER

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9	M	E	3	(	Q	)

Education Bureau

Territory-wide System Assessment 2023

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. $2^3 =$

A. 2×3 .

B. $2 \times 2 \times 2$.

C. 3×3 .

D. $2 + 3$.

2. Which of the following is an irrational number?

A. 0.14

B. $\sqrt[3]{27}$

C. 2π

D. $\frac{1}{3}$

3. Mary used cocoa powder and sugar in the ratio $2 : 5$ by weight to make chocolate cupcakes. What is the weight of the cocoa powder needed if she used 140 g of sugar to make chocolate cupcakes?

A. 40 g

B. 56 g

C. 100 g

D. 350 g

4. Which of the following statements is correct?

A. The solution of $x-8=0$ is $-\frac{1}{8}$.

B. The solution of $x+8=0$ is $-\frac{1}{8}$.

C. The solution of $8x-1=0$ is $-\frac{1}{8}$.

D. The solution of $8x+1=0$ is $-\frac{1}{8}$.

5. Jack took x seconds to complete 26 multiple choice questions. If he spends 1 second less on average for each multiple choice question, he will complete 2 more multiple choice questions in the same amount of time. Which of the following equations can be used to find the value of x ?

A. $\frac{x}{26}-1=2$

B. $\frac{x}{24}-\frac{x}{26}=1$

C. $\frac{x}{26}-\frac{x}{28}=1$

D. $\frac{x}{2}-\frac{x}{26}=1$

6. Which of the following points lies on the straight line $y = 9x + 3$?

A. (0, 3)

B. (3, 0)

C. (–1, 6)

D. (1, –6)

7. Simplify $\frac{x^2}{2x^{-3}}$.

A. $\frac{x}{2}$

B. $2x$

C. $2x^5$

D. $\frac{x^5}{2}$

8. $1.86 \times 10^3 =$

A. 1 860 .

B. 186 000 .

C. 0.001 86 .

D. 0.000 186 .

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

A. $3+\frac{2}{y^2}$

B. $3+\frac{y^2}{2}$

C. $3+2y$

D. $3+2y^2$

10. If $x \leq y$, which of the following inequalities is correct?

A. $\frac{x}{3} \geq \frac{y}{3}$

B. $3x \geq 3y$

C. $-3x \leq -3y$

D. $x - 3 \leq y - 3$

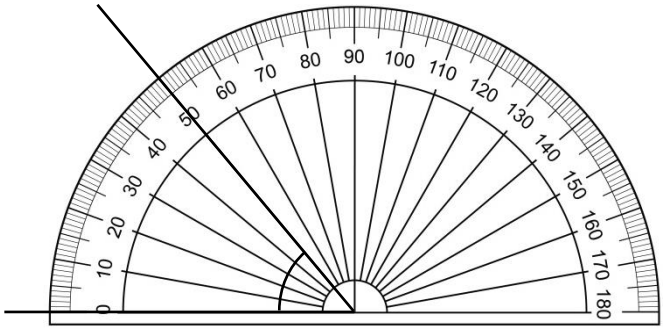
11. Jack uses a protractor to measure an angle and the result is $50°$ (correct to the nearest $1°$). Find the maximum absolute error of the measurement.

A. $0.1°$

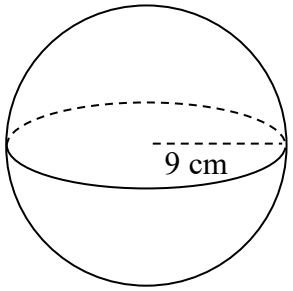
B. $0.5°$

C. $1°$

D. $5°$



12. The figure shows a sphere. Its radius is 9 cm. Find the volume of the sphere.



A. $2\pi(9)^2$ cm^3

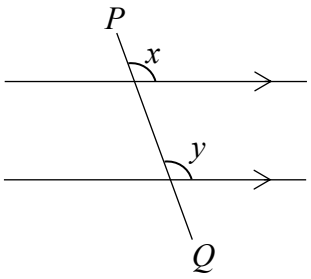
B. $4\pi(9)^2$ cm^3

C. $\frac{1}{3}\pi(9)^3$ cm^3

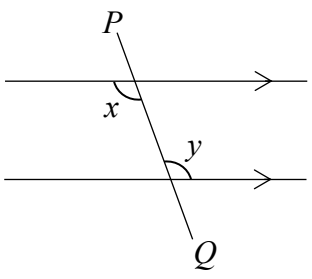
D. $\frac{4}{3}\pi(9)^3$ cm^3

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

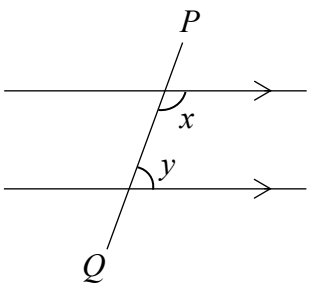
A.



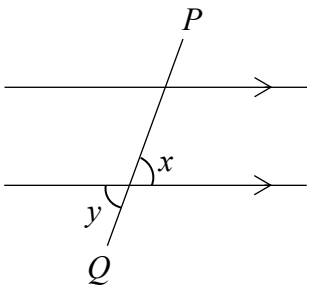
B.



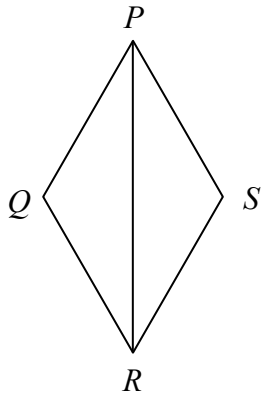
C.



D.



14. Which of the following represents the rhombus in the figure?



A. $PQRS$

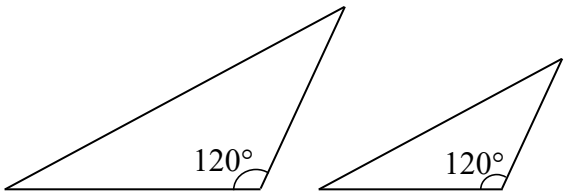
B. $\triangle PQR$

C. PR

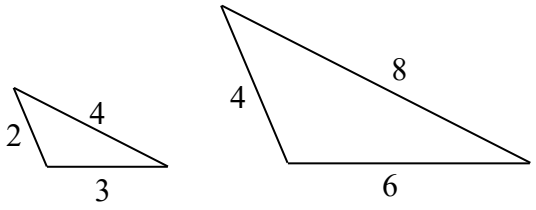
D. P

15. Which of the following pairs of triangles **MUST** be similar?

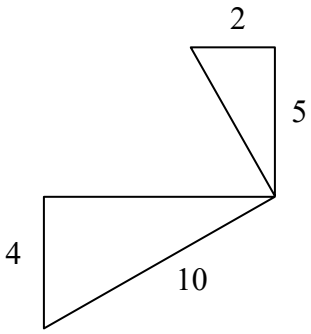
A.



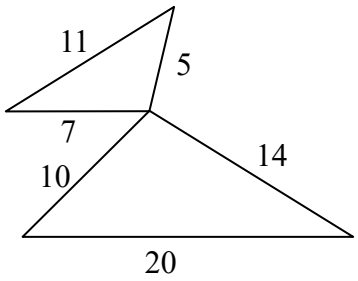
B.



C.



D.



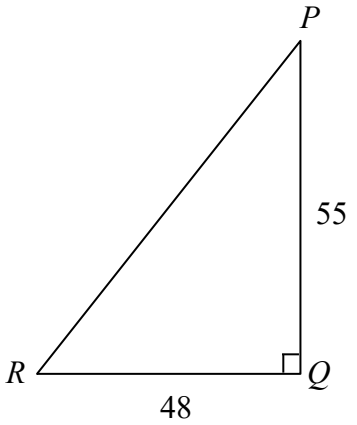
16. In the figure, $\triangle PQR$ is a right-angled triangle. If $PQ = 55$ and $QR = 48$, find PR.

A. $\sqrt{55 + 48}$

B. $\sqrt{55^2 - 48^2}$

C. $\sqrt{55^2 + 48^2}$

D. $55^2 + 48^2$



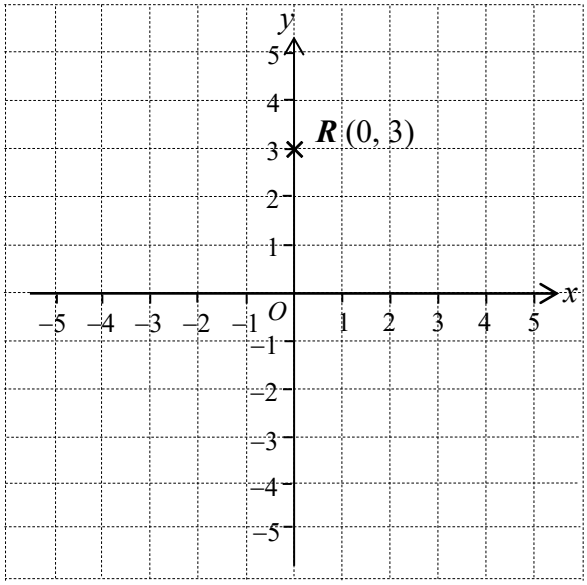
17. In the figure, $\boldsymbol{R}$ (0, 3) is rotated about the origin O through 90° in a clockwise direction to $\boldsymbol{R'}$. Find the coordinates of $\boldsymbol{R'}$.

A. (0, −3)

B. (−3, 0)

C. (3, 0)

D. (0, 3)



18. It is given that the slope of a straight line ℓ is $-\frac{1}{6}$. Which of the following straight lines is parallel to ℓ?

Line	L_1	L_2	L_3	L_4
Slope	6	–6	$\frac{1}{6}$	$-\frac{1}{6}$

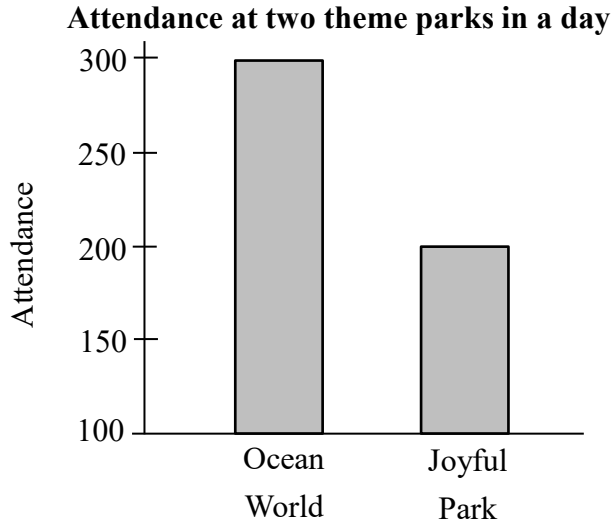
A. L_1

B. L_2

C. L_3

D. L_4

19. The diagram below shows the attendance at two theme parks in a day.



Based on the diagram above, Charles believes that the attendance at "Ocean World" is double the attendance at "Joyful Park" on that day.
Which of the following statements is the best reason that Charles is **misled** by the above diagram?

A. The scale of vertical axis in the diagram does not start from 0.

B. The number of days the two theme parks were open is not shown.

C. The attendance on other days is not shown.

D. The number of staff at the two theme parks is not shown.

20. The following table shows the service status of trains and their corresponding frequency at a station yesterday.

Service status	Left ahead of time	Left on time	Left behind schedule
Frequency	0	1997	3

Find the relative frequency of the service status “left behind schedule” at the station yesterday.

A. 0

B. $\frac{1997}{2000}$

C. $\frac{3}{2000}$

D. $\frac{3}{1997}$

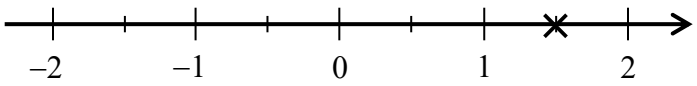
SECTION B: Write ALL the answers in the ANSWER BOOKLET.
Working need not be shown.

21. Calculate $6 \times [4 + (7 - 10 \div 2)]$.

22. Calculate $\dfrac{(-5)(-3)}{-2-3}$.

23. Use the symbol '×' to mark the number -0.25 on the number line given in the **ANSWER BOOKLET**.

Example : 1.5 is marked on the number line below.



24. The marked price of a cake is \$320 . If it is sold at 30% off, find the discount.

25. The nth term of a sequence is $4 + 2(n - 1)$. Find the value of the 3rd term of the sequence.

26. Find the value of $(-5)^0$.

Go on to the next page

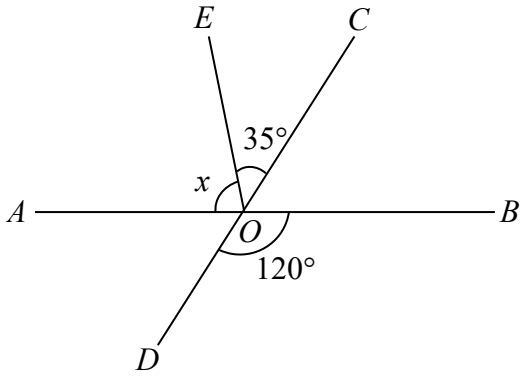
27. Expand $(y-4)^2$.

28. Factorise $25x^2 - 1$.

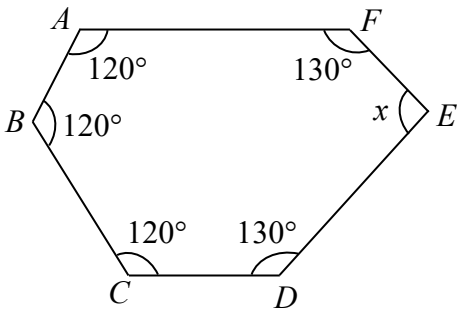
29. Consider the formula $c = \dfrac{ab}{a+b}$. If $a = 10$ and $b = 15$, find the value of c .

30. Solve the inequality $4x + 7 < -1$.

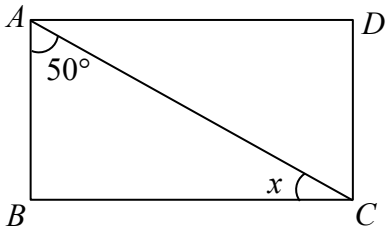
31. In the figure, AOB and COD are straight lines. $\angle COE = 35°$ and $\angle BOD = 120°$. Find x .



32. The figure shows a hexagon $ABCDEF$. Find x.

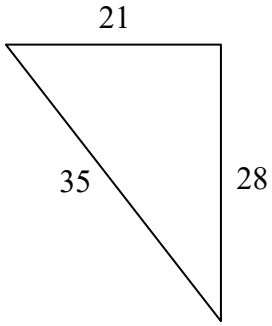


33. In the figure, AC is the diagonal of rectangle $ABCD$. It is given that $\angle BAC = 50°$. Find x.

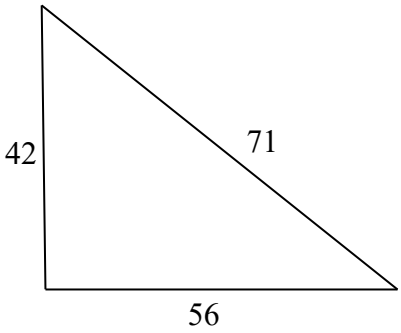


34. Which of the following **MUST** be right-angled triangle(s)? (May be more than one answer)

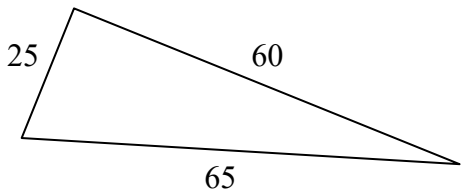
Triangle P



Triangle Q

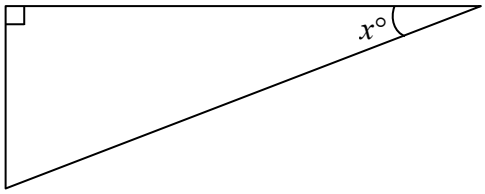


Triangle R



35. Find the distance between two points $P(9, 13)$ and $Q(3, 5)$ in the rectangular coordinate plane.

36. In the figure, $\sin x° = \frac{1}{\sqrt{7}}$. Find the value of x. (Correct to 3 significant figures)

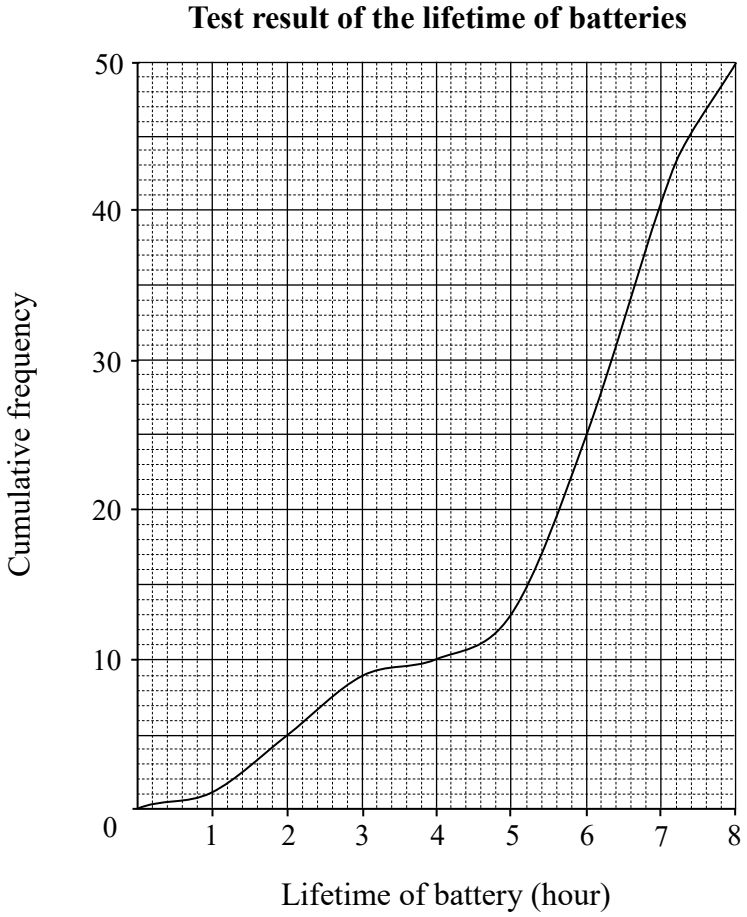


37. The following data shows the average traffic flow (number of vehicles per minute) of a location in last 15 days.

42	20	5	30	12
44	40	36	22	24
33	38	16	18	24

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

38. The cumulative frequency curve below shows the result of the lifetime of some batteries in a test.



According to the cumulative frequency curve shown above, answer the following questions.

(a) How many batteries have been examined in the test?

(b) Find the median of the lifetime of batteries in the test.

(c) If the lifetime of a battery is not more than 2 hours, its quality does not meet the requirement. How many batteries do not meet the requirement in the test?

39. Simon joined an admission examination for a university this year. The following table shows the weight in each subject of the admission scoring scheme and his scores in these subjects.

	Subject			
	English Language	Mathematics	Chemistry	Physics
Score	4	5	2	3
Weight	40%	30%	10%	20%

Find the weighted mean score of Simon.

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. Winnie deposits \$5 000 in a bank and the interest rate is 8% p.a. **compounded** yearly. Find the interest she will receive after 2 years.

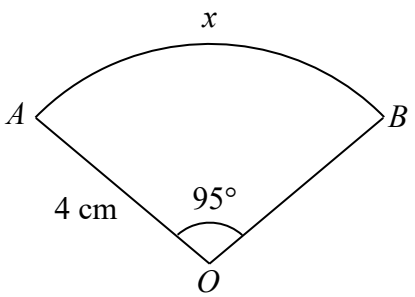
41. Complete the table for the equation $2x - y + 1 = 0$ in the **ANSWER BOOKLET**.

x	–3	0	2
y		1	

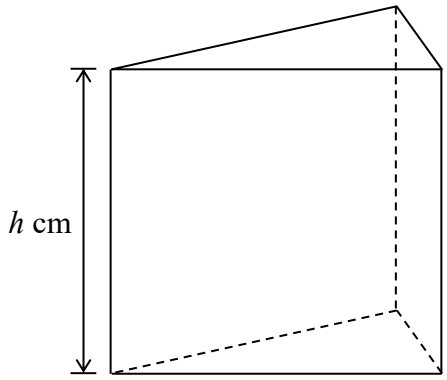
According to the table, plot the graph of this equation on the rectangular coordinate plane given in the **ANSWER BOOKLET**.

42. Solve the simultaneous equations $\begin{cases} y = 3x + 8 \\ x + y = 4 \end{cases}$.

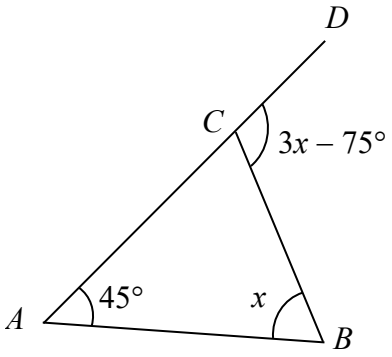
43. In the figure, the radius of sector OAB is 4 cm and $\angle AOB = 95°$. Let x be the arc length of the sector, find x. Give the answer correct to 3 significant figures.



44. In the figure, the volume of a solid triangular prism is $768\ \text{cm}^3$. Its base area is $64\ \text{cm}^2$. The height of the prism is h cm. Find the value of h.



45. In the figure, ACD is a straight line. $\angle BAD = 45°$ and $\angle BCD = 3x - 75°$. Find x.



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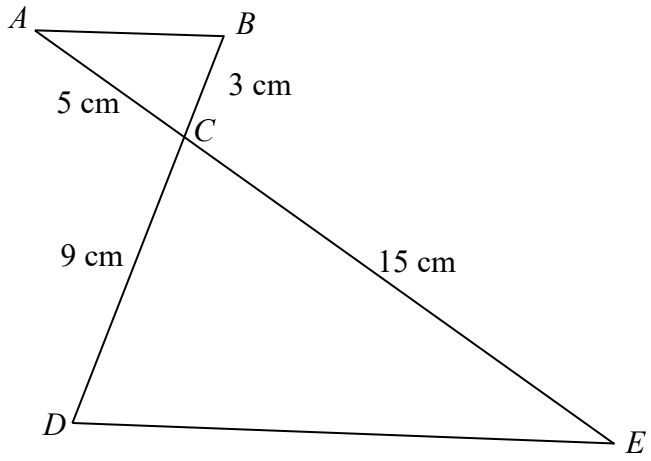
46. In the figure, ACE and BCD are straight lines. $CB = 3\text{cm}$, $CA = 5$ cm, $CD = 9$ cm and $CE = 15$ cm. Prove that $\triangle CAB \sim \triangle CED$.



47. The following table shows the distribution of the weight of 24 tomatoes.

Weight (g)	Class Mark (g)	Frequency
150 – 169	159.5	7
170 – 189	179.5	6
190 – 209	199.5	
210 – 229	219.5	7

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

(b) Construct the frequency polygon in the **ANSWER BOOKLET** to represent the above data.

END OF PAPER

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Answers written on this page will not be marked.

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Please stick the barcode label in the box.

Education Bureau
Territory-wide System Assessment 2023
Secondary 3 Mathematics
ANSWER BOOKLET

INSTRUCTIONS

1. Write your School Code, Class and Class Number in the boxes provided on this page.
2. Stick barcode labels in the spaces provided on page 1 and page 3.
3. Time allowed is 65 minutes.
4. Write ALL your answers in the spaces provided in this ANSWER BOOKLET.
5. Do not write in the margins.
6. Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.
7. The use of HKEAA approved calculators is permitted.
8. Rough work should be done on the rough work sheet provided.

School Code | S | | | |

Class | 3 | |

Class No. | | |

Write one capital letter in this box.

SECTION A: Multiple Choice Questions

MC Questions – Blacken the circle under the correct answer with an **HB pencil**. For example :

A	B	C	D
●	○	○	○

1.	A	B	C	D
	○	○	○	○
2.	A	B	C	D
	○	○	○	○
3.	A	B	C	D
	○	○	○	○
4.	A	B	C	D
	○	○	○	○
5.	A	B	C	D
	○	○	○	○
6.	A	B	C	D
	○	○	○	○
7.	A	B	C	D
	○	○	○	○
8.	A	B	C	D
	○	○	○	○
9.	A	B	C	D
	○	○	○	○
10.	A	B	C	D
	○	○	○	○

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Please stick the barcode label in the box. →

	A	B	C	D
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

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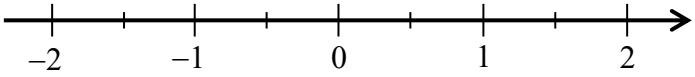
SECTION B: Write your answers in the spaces provided. Working need not be shown.

21. _____

22. _____

23. 

24. The discount of the cake is _____ .

25. The value of the 3rd term of the sequence is _____ .

26. _____

27. _____

28. _____

29. c = _____

30. _____

31. x = _____

32. x = _____

33. x = _____

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34. _____

35. PQ = _____ units

36. x = _____

37.

Table 1	
Number of vehicles per minute	Frequency
0 – 14	
15 – 29	6
30 – 44	

Table 2	
Number of vehicles per minute	Frequency
0 – 8	
9 – 17	2
18 – 26	
27 – 35	2
36 – 44	

38. (a) _____ batteries have been examined in the test.

(b) The median of the lifetime of batteries is _____ hours in the test.

(c) _____ batteries do not meet the requirement in the test.

39. The weighted mean score of Simon is _____ .

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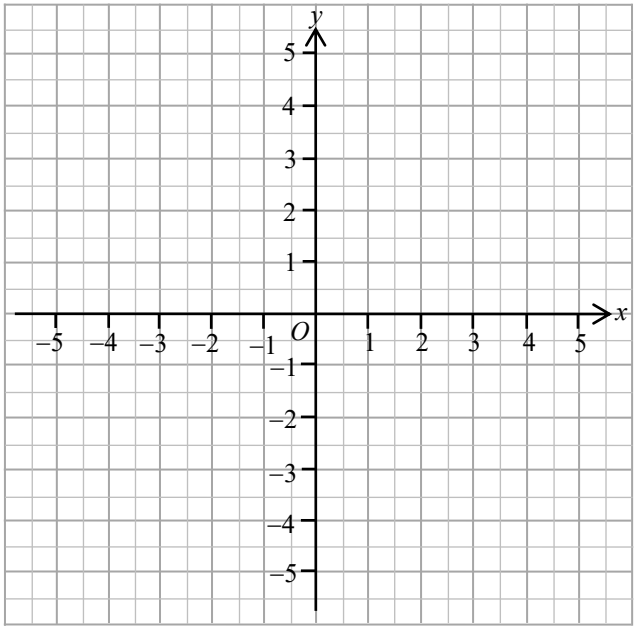
SECTION C: Answer in the spaces provided.
All working and conclusions must be clearly shown.

40.

41. $2x - y + 1 = 0$

x	–3	0	2
y		1	



42.

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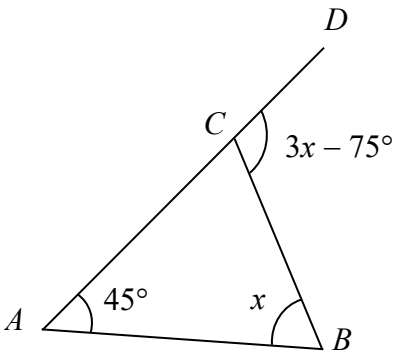
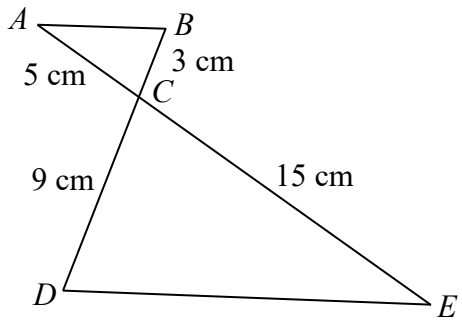
43.

44.

45.



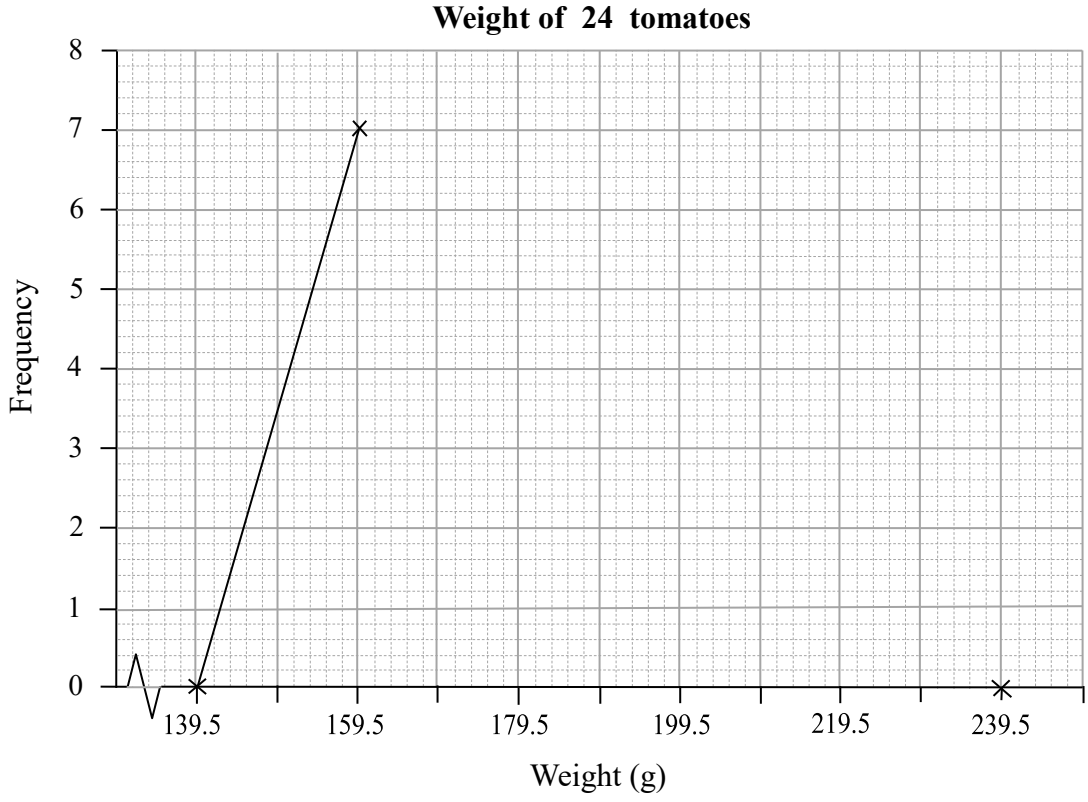
46.



47. (a)

Weight (g)	Class Mark (g)	Frequency
150 – 169	159.5	7
170 – 189	179.5	6
190 – 209	199.5	
210 – 229	219.5	7

(b)



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Education Bureau

Territory-wide System Assessment 2023

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 $2^2 \times 3$ and $2 \times 3^2 \times 5$.

A. 2×3

B. $2 \times 3 \times 5$

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

D. $2^3 \times 3^3 \times 5$

2. $x^2 - y^2 =$

A. $2x - 2y$.

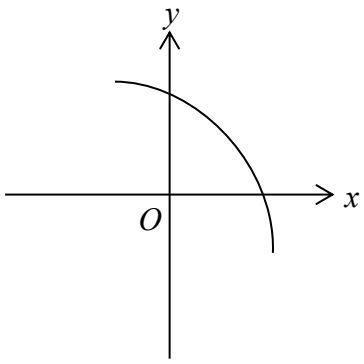
B. $x \cdot x - y \cdot y$.

C. $(x - y)^2$.

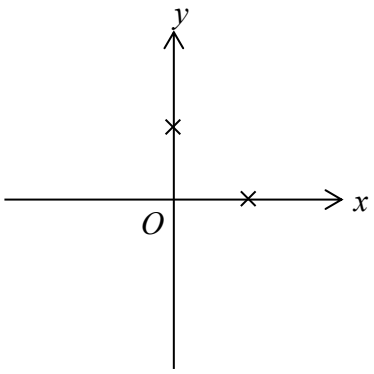
D. $x \cdot x + y \cdot y$.

3. Which of the following may represent the graph of the equation $x+y-7=0$?

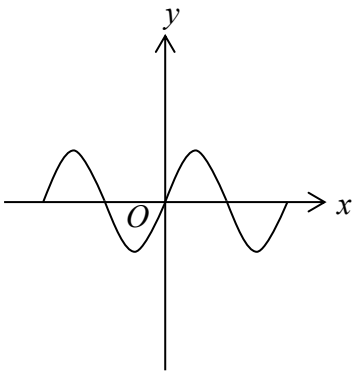
A.



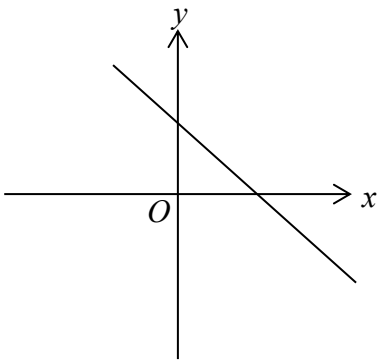
B.



C.



D.



4. $A\,(3,-4)$ and $B\,(9,-2)$ are two points in the rectangular coordinate plane. The coordinates of the mid-point of AB are

A. $(12,-6)$.

B. $(6,-3)$.

C. $(3,1)$.

D. $(-3,-1)$.

5. Nancy and Ivan weigh x kg and y kg respectively. Their total weight is 70 kg. 3 times Nancy's weight equals 2 times Ivan's weight. Which of the following pairs of simultaneous equations shows the relation between x and y?

A. $\begin{cases} x + y = 70 \\ 2x = 3y \end{cases}$

B. $\begin{cases} x + y = 70 \\ 3x = 2y \end{cases}$

C. $\begin{cases} 2x + 3y = 70 \\ 2x = 3y \end{cases}$

D. $\begin{cases} 3x + 2y = 70 \\ 3x = 2y \end{cases}$

6. Use a scientific notation to represent 0.000 000 12 .

A. 0.12×10^{-6}

B. 0.12×10^{-7}

C. 1.2×10^{-6}

D. 1.2×10^{-7}

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

A. $3 + \frac{2}{y^2}$

B. $3 + \frac{y^2}{2}$

C. $3 + 2y$

D. $3 + 2y^2$

8. $a\,(3a + b - 1) =$

A. $4a + b - 1$.

B. $4a + ab - a$.

C. $3a^2 + ab - a$.

D. $3a^2 + b - 1$.

9. Which of the following is an identity?

A. $x - 3 = 3 - x$

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

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

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

10. If $x \leq y$, which of the following inequalities is correct?

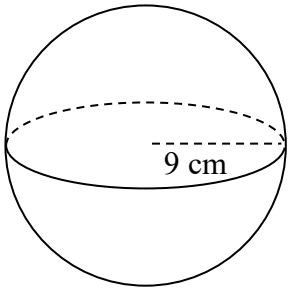
A. $\frac{x}{3} \geq \frac{y}{3}$

B. $3x \geq 3y$

C. $-3x \leq -3y$

D. $x - 3 \leq y - 3$

11. The figure shows a sphere. Its radius is 9 cm. Find the volume of the sphere.



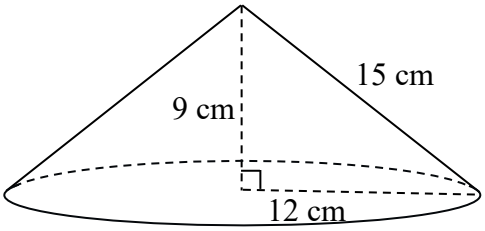
A. $2\pi(9)^2$ cm^3

B. $4\pi(9)^2$ cm^3

C. $\frac{1}{3}\pi(9)^3$ cm^3

D. $\frac{4}{3}\pi(9)^3$ cm^3

12. The figure shows a solid right circular cone. Its height is 9 cm. Its base radius is 12 cm and its slant height is 15 cm. Find the total surface area of the cone.



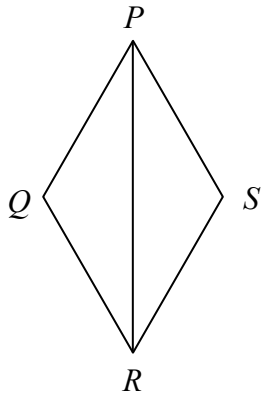
A. $\pi(12)(15)$ cm^2

B. $\frac{1}{3}\pi(12)^2(9)$ cm^2

C. $[\pi(12)(15) + \pi(12)^2]$ cm^2

D. $\pi(12)^2(9)$ cm^2

13. Which of the following represents the rhombus in the figure?



A. $PQRS$

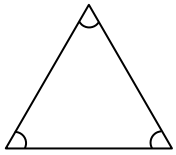
B. $\triangle PQR$

C. PR

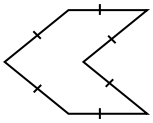
D. P

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

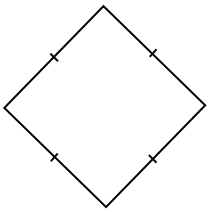
A.



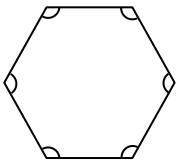
B.



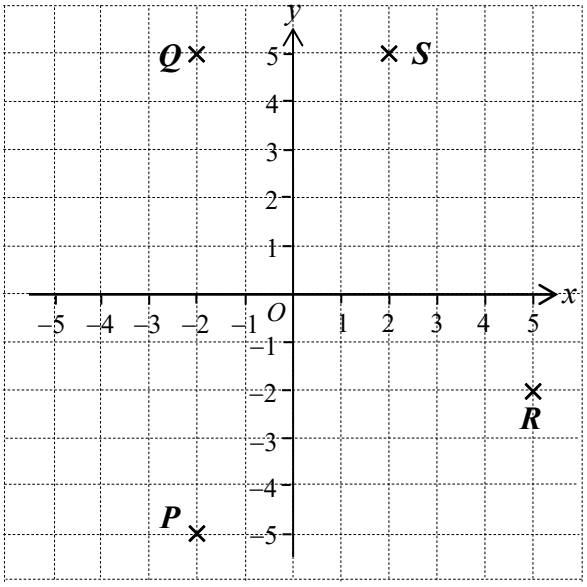
C.



D.



15. In the figure, which point can be represented by $(-2, 5)$?



A. P

B. Q

C. R

D. S

Go on to the next page

16. Which of the following points lies on the straight line $y = 9x + 3$?

A. (0, 3)

B. (3, 0)

C. (–1, 6)

D. (1, –6)

17. It is given that the slope of a straight line ℓ is $-\frac{1}{6}$. Which of the following straight lines is parallel to ℓ ?

Line	L_1	L_2	L_3	L_4
Slope	6	–6	$\frac{1}{6}$	$-\frac{1}{6}$

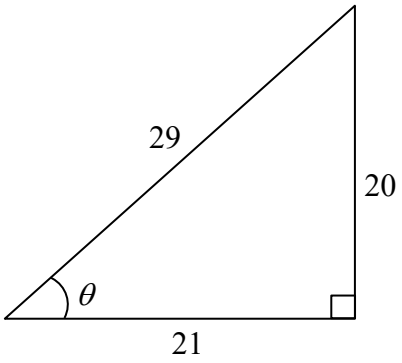
A. L_1

B. L_2

C. L_3

D. L_4

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



A. $\frac{20}{29}$

B. $\frac{21}{29}$

C. $\frac{20}{21}$

D. $\frac{21}{20}$

19. Carmen applied for admission to a secondary school. The table below shows the weights of the admission criterion and her marks in these areas.

	Admission Criterion		
	Interview	Learning Portfolio	Extra-Curricular Activity
Mark	70	80	90
Weight	5	3	2

Find the weighted mean mark of Carmen.

A. 24

B. 77

C. 80

D. 240

20. The following table shows the service status of trains and their corresponding frequency at a station yesterday.

Service status	Left ahead of time	Left on time	Left behind schedule
Frequency	0	1997	3

Find the relative frequency of the service status "left behind schedule" at the station yesterday.

A. 0

B. $\frac{1997}{2000}$

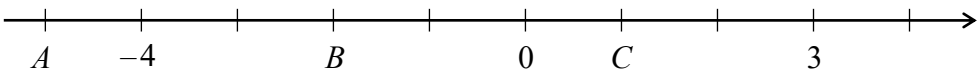
C. $\frac{3}{2000}$

D. $\frac{3}{1997}$

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

21. Use powers to express $5 \times 5 \times 5$.

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



23. Round off 381 500 to 3 significant figures.

24. The marked price of a cake is $\$320$. If it is sold at 30% off, find the discount.

25. A box contains 20 jelly candies. 8 of them are orange in colour and the rest are yellow. Find the ratio of the number of orange jelly candies to that of yellow jelly candies.

26. Simplify $(3x - 7) + (8 - 3x)$.

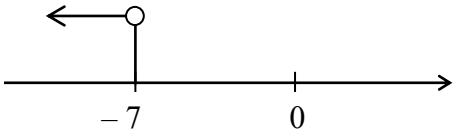
27. Expand $(x - 1)(x + 5)$.

28. Expand $(-x + 4)(-3x)$.

29. Factorise $x^2 + 12x + 36$.

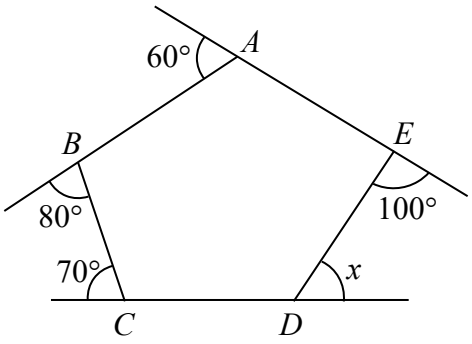
30. Simplify $\frac{1}{2x} + \frac{2}{x}$.

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

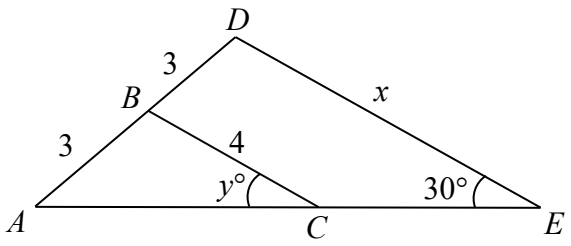


32. Alice runs around the park. She takes 80 seconds (correct to the nearest second) to finish a lap. Find the percentage error of the measured value.

33. The figure shows a pentagon $ABCDE$ and its exterior angles. Find x .



34.

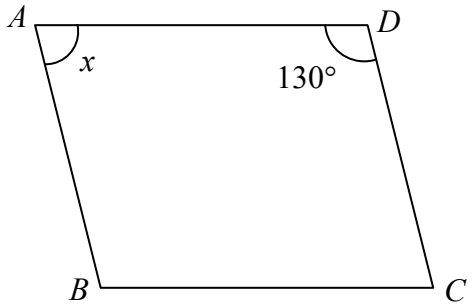


In the figure, $\triangle ABC \sim \triangle ADE$. Find

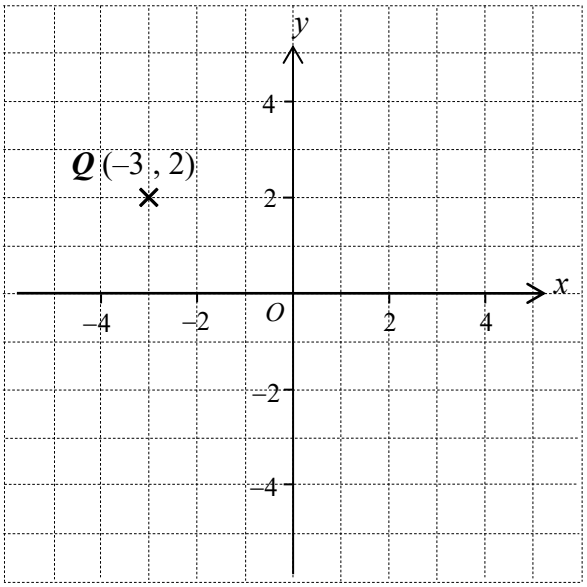
(a) the value of x ,

(b) the value of y .

35. In the figure, $ABCD$ is a parallelogram. It is given that $\angle ADC = 130°$. Find x.



36. In the figure, $\boldsymbol{Q}\,(-3\,,\,2)$ is translated downwards by 2 units to $\boldsymbol{Q'}$. Find the coordinates of $\boldsymbol{Q'}$.

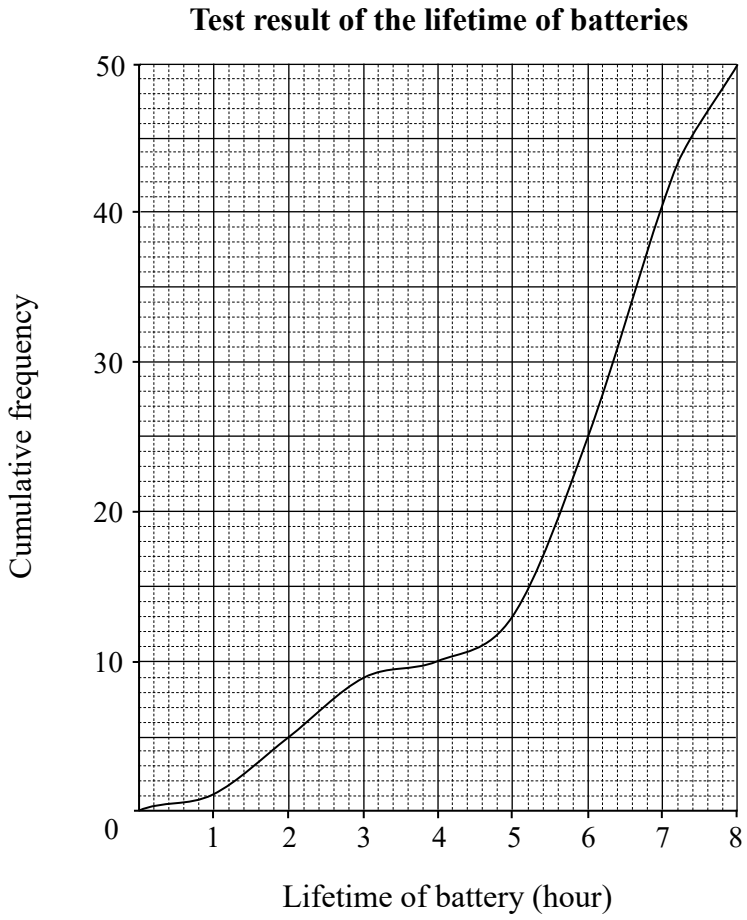


37. The following data shows the average traffic flow (number of vehicles per minute) of a location in last 15 days.

42	20	5	30	12
44	40	36	22	24
33	38	16	18	24

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

38. The cumulative frequency curve below shows the result of the lifetime of some batteries in a test.



According to the cumulative frequency curve shown above, answer the following questions.

(a) How many batteries have been examined in the test?

(b) Find the median of the lifetime of batteries in the test.

(c) If the lifetime of a battery is not more than 2 hours, its quality does not meet the requirement. How many batteries do not meet the requirement in the test?

39. The table below shows the amount of "Consumption Voucher" spent by 36 people within the first week.

Amount Spent (dollar)	1 – 1 000	1 001 – 2 000	2 001 – 3 000	3 001 – 4 000	4 001 – 5 000
Number of people	2	6	11	2	15

Find the modal class of the amount of "Consumption Voucher" spent by the 36 people.

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

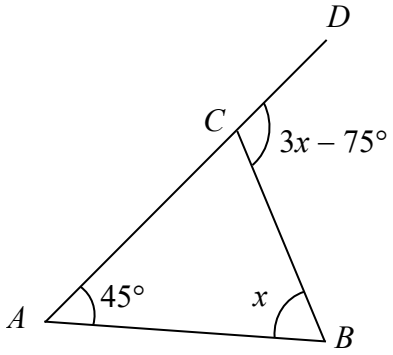
40. Peter exchanges 86 000 Japanese Yen in a bank for Hong Kong dollars. The exchange rate is 100 Japanese Yen to 6.5 Hong Kong dollars. Find the amount in Hong Kong dollars he should receive.

41. Complete the table for the equation $y = 2x + 1$ in the **ANSWER BOOKLET**.

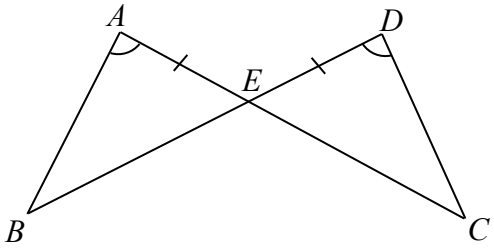
x	–3	0	2
y		1	

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

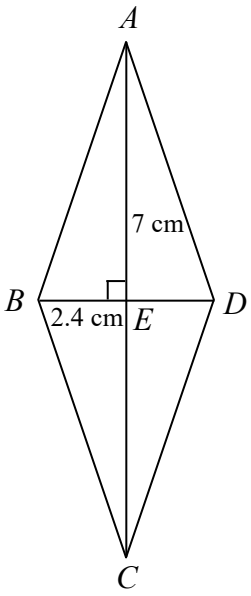
42. In the figure, ACD is a straight line. $\angle BAD = 45°$ and $\angle BCD = 3x - 75°$. Find x.



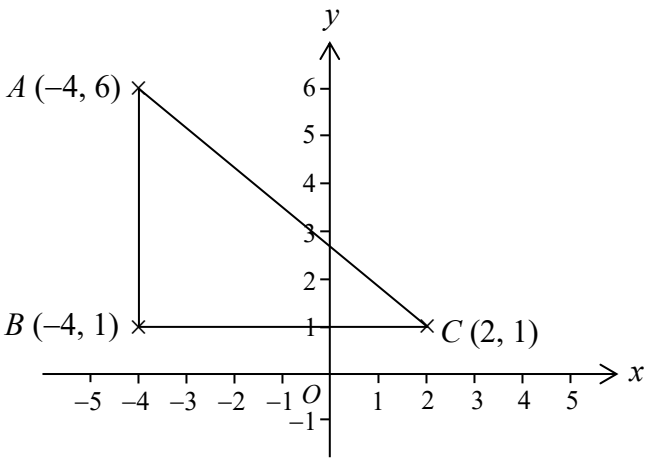
43. In the figure, AEC and DEB are straight lines. $\angle BAE = \angle CDE$ and $AE = DE$. Prove that $\triangle ABE \cong \triangle DCE$.



44. In the figure, $ABCD$ is a rhombus. AC and BD are perpendicular to each other and they intersect at point E. It is given that $AE = 7$ cm and $BE = 2.4$ cm. Find the perimeter of the rhombus.



45. Find the area of $\triangle ABC$ in the figure.



46. The table below shows the results of 3A students in a Mathematics competition.

Result (mark)	1 – 20	21 – 40	41 – 60	61 – 80	81 – 100
Frequency	5	8	12	4	1

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

(b) Find the mean of the Mathematics competition results of 3A students.

47. A dessert shop offers three flavours of shaved ice including watermelon (W), strawberry (S) and chocolate (C). Each portion of shaved ice can have one topping of nuts (N), marshmallows (M) or biscuit (B).

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

(b) If Kelvin chooses a shaved ice flavour and a topping randomly, find the probability that he chooses watermelon shaved ice with nuts.

END OF PAPER

Do not write on this page.

Answers written on this page will not be marked.

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Prepared by the Hong Kong Examinations
and Assessment Authority

* 9 M E 4 *

9	M	E	4	(	A	)

Please stick the barcode label in the box.

Education Bureau
Territory-wide System Assessment 2023
Secondary 3 Mathematics
ANSWER BOOKLET

INSTRUCTIONS

1. Write your School Code, Class and Class Number in the boxes provided on this page.
2. Stick barcode labels in the spaces provided on page 1 and page 3.
3. Time allowed is 65 minutes.
4. Write ALL your answers in the spaces provided in this ANSWER BOOKLET.
5. Do not write in the margins.
6. Unless otherwise specified, numerical answers should be either exact or correct to 3 significant figures.
7. The use of HKEAA approved calculators is permitted.
8. Rough work should be done on the rough work sheet provided.

School Code	S				Class	3		Class No.		

Write one capital letter in this box.

SECTION A: Multiple Choice Questions

MC Questions – Blacken the circle under the correct answer with an **HB pencil**. For example :

A	B	C	D
●	○	○	○

	A	B	C	D
1.	○	○	○	○
2.	○	○	○	○
3.	○	○	○	○
4.	○	○	○	○
5.	○	○	○	○
6.	○	○	○	○
7.	○	○	○	○
8.	○	○	○	○
9.	○	○	○	○
10.	○	○	○	○

Please do not write in the margin.

Please do not write in the margin.

Please stick the barcode label in the box. →

	A	B	C	D
11.	○	○	○	○
12.	○	○	○	○
13.	○	○	○	○
14.	○	○	○	○
15.	○	○	○	○
16.	○	○	○	○
17.	○	○	○	○
18.	○	○	○	○
19.	○	○	○	○
20.	○	○	○	○

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SECTION B: Write your answers in the spaces provided. Working need not be shown.

21. _____

22. A = _____

B = _____

C = _____

23. _____

24. The discount of the cake is _____ .

25. Number of orange jelly candies : Number of yellow jelly candies

= _____ : _____

26. _____

27. _____

28. _____

29. _____

30. _____

31. _____

32. The percentage error of the measured value is _____ .

33. x = _____

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Please do not write in the margin.

34. (a) $x =$ _____

(b) $y =$ _____

35. $x =$ _____

36. The coordinates of $\boldsymbol{Q'}$ are (_____ , _____).

37.

Table 1	
Number of vehicles per minute	Frequency
0 – 14	
15 – 29	6
30 – 44	

Table 2	
Number of vehicles per minute	Frequency
0 – 8	
9 – 17	2
18 – 26	
27 – 35	2
36 – 44	

38. (a) _____ batteries have been examined in the test.

(b) The median of the lifetime of batteries is _____ hours in the test.

(c) _____ batteries do not meet the requirement in the test.

39. The modal class of the amount of "Consumption Voucher" spent by the 36 people is \$ _____ – \$ _____ .

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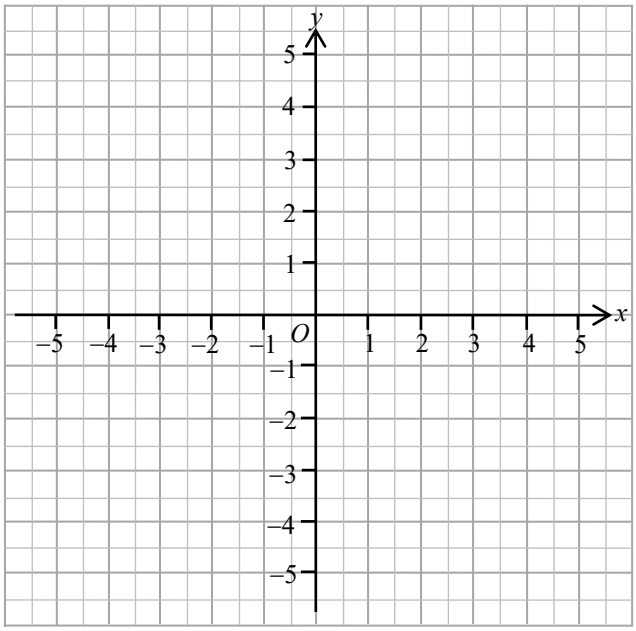
Go on to the next page

SECTION C: Answer in the spaces provided.
All working and conclusions must be clearly shown.

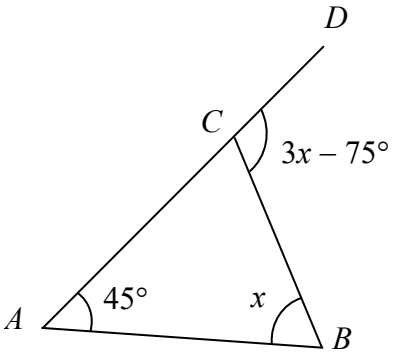
40.

41. $y = 2x + 1$

x	–3	0	2
y		1	



42.



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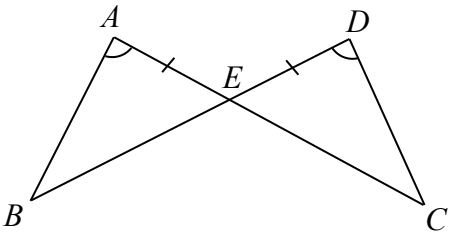
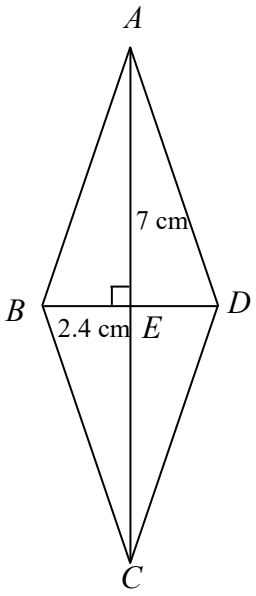
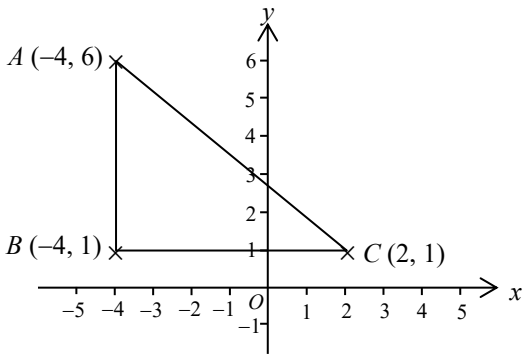
43.



44.



45.



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46. (a)

Result (mark)	1 – 20	21 – 40	41 – 60	61 – 80	81 – 100
Class Mark (mark)	10.5		50.5		90.5
Frequency	5	8	12	4	1

(b)

47. (a)

		Shaved ice		
		Watermelon (W)	Strawberry (S)	Chocolate (C)
Topping	Nuts (N)	NW		NC
	Marshmallows (M)	MW	MS	
	Biscuit (B)		BS	BC

(b) The probability that Kelvin chooses watermelon shaved ice with nuts

= _____

END OF PAPER

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