2022 Year 8 Topic Tests Information Sheet

2022 Year 8 Topic Tests is a set of short answer questions and their solutions.

The topics covered are:
- Numbers, Percentages and Fractions (4 questions)
- Ratios, Rates and Time (4 questions)
- Patterns and Algebra (4 questions)
- Geometry (4 questions)
- Linear Relationships (5 questions)
- Probability (3 questions)
- Statistics (3 questions)

2022 Year 8 Topic Tests also includes a **Mid-year test** that consists of:
- 15 multiple choice questions
- 5 short answer questions
- 2 extended response questions

Mid-year test covers all topic except Probability and Statistics.

Distribution
Electronic copies will be emailed to you

File format
MS Word DOCX format and PDF format

Release date
1st of March 2022

Pricing
$105

2022 Year 8 Mathematics
Numbers, Percentages and Fractions Test

Time allowed: 1 hour
Total marks: 35 marks

Question 1 (8 marks)

a. Evaluate 1.55×2. 1 mark

_____

b. Is 2.5 an integer? 1 mark
Circle the correct answer.

Yes No

c. Evaluate $(2^2)^2$. 2 marks

_____

_____

d. Simplify $4 \div \frac{12}{5}$. 2 marks
Write your answer as a mixed fraction.

_____

_____

e. Evaluate $-(2 \times 3 - (-6)) + 1$. 2 marks

_____

_____

_____

Question 4 (9 marks)

a. Lisa paid $1,741.50 for a computer after receiving a 10% discount. 2 marks

Find the price of the computer.

b. A steel pole is uniformly shaped. 2 marks

The length of the pole is $3\frac{3}{4}$ metres and its weight is $3\frac{1}{8}$ kilograms.

Find the weight of the pole per metre.

c. 2 marks

$$10 < 2 \div \frac{1}{n} < 20$$

Find all positive integers n that satisfy the inequality above.

d. 486.3 kg of flour is to be put into bags. Each bag can hold 5 kg of flour. 3 marks

How many bags can be filled with flour and what will be the remaining amount of flour?

2022 Year 8 Mathematics
Numbers, Percentages and Fractions Test
Total marks: 35 marks

Question 1 (8 marks)

a. 1 mark

$1.55 \times 2 = 3.1$ (A1)

b. 1 mark

No (A1)

c. 2 marks

$(2^2)^2 = 4^2$ (A1)

$= 16$ (A1)

● Award full marks for the correct answer.

d. 2 marks

$4 \div \frac{12}{5} = 4 \times \frac{5}{12}$ (A1)

$= 1\frac{2}{3}$ (A1)

e. 2 marks

$-(2 \times 3 - (-6)) + 1 = -12 + 1$ (A1)

$= -11$ (A1)

2022 Year 8 Mathematics
Ratios, Rates and Time Test

Time allowed: 1 hour
Total marks: 35 marks

Question 1 (8 marks)

a. What is the time 1 hours and 35 minutes after 11:30 pm? 2 marks
Write your answer in 24-hour time.

_____

_____

b. Find the number of seconds between the times 2:31 pm and 3:01 pm. 2 marks

_____

_____

c. Consider the following train timetable.

Melbourne City Train			
Malvern	08:15 am	08:42 am	09:02 am
Armadale	08:17 am	08:44 am	09:04 am
Toorak	08:22 am	08:49 am	09:09 am
South Yarra	08:27 am	08:54 am	09:14 am
Flinders Street Station	08:33 am	09:00 am	09:20 am

i. If Jason boards the 8:42 am train at Malvern, at what time will he arrive at South Yarra? 1 mark

_____

ii. How long does the train trip from Malvern to Flinders Street Station take? 1 mark

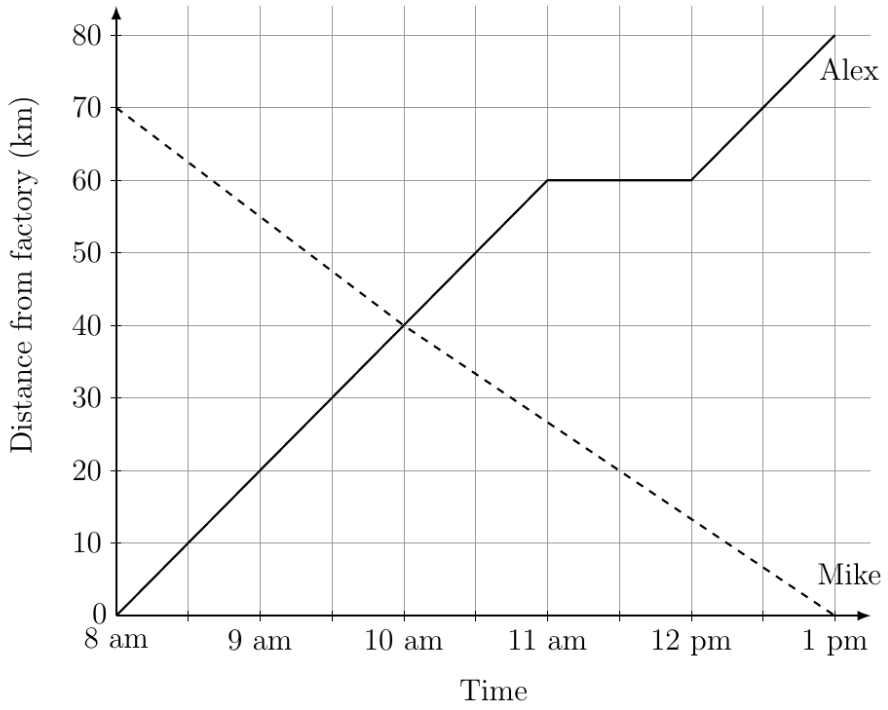
_____

iii. Lachlan is waiting at Armadale at 8:25 am. 2 marks
How long will it take him to get to Flinders Street Station if he boards the next train?

_____

_____

e. Alex travels from a factory, whereas Mike travels to the factory one morning. They both begin their journeys at 8 am.
The following travel graphs show their trips.



i. At what time were Alex and Mike both 40 km from the factory? 1 mark

_____

ii. What is the combined distance travelled by Alex and Mike at the end of their journeys? 1 mark

_____

iii. Who travelled faster in the first 2 hours? 2 marks
Justify your answer.

_____

_____

2022 Year 8 Mathematics
Ratios, Rates and Time Test
Total marks: 35 marks

Question 1 (8 marks)

a. 2 marks

0105

● Correct hour part. (A1)

● Correct minute part. (A1)

b. 2 marks

There are 30 minutes between 2:31 pm and 3:01 pm. (A1)

Therefore, $30 \times 60 = 1{,}800$ seconds (A1)

c.

i. 1 mark

08:54 am (A1)

ii. 1 mark

18 minutes (A1)

iii. 2 marks

The train arrives after 19 minutes (at 08:44 am), and the train trip lasts for 16 minutes.

● Working is shown. (A1)

Therefore, $19 + 16 = 35$ minutes. (A1)

Question 2 (8 marks)

a. 1 mark

kg (A1)

b. 1 mark

4,500 kg = 4.5 t (A1)

c. 2 marks

$18\ m^2 = 180{,}000\ cm^2$ (A1)×2

d. 2 marks

4000×30 (A1)

$= 120{,}000\ cm$

$= 1.2\ km$ (A1)

e. 2 marks

500×0.63 (A1)

$= €315$ (A1)

2022 Year 8 Mathematics
Patterns and Algebra Test

Time allowed: 1 hour
Total marks: 35 marks

Question 1 (10 marks)

a. Simplify $k + k + k + k + k$. 2 marks

b. Simplify $2n^2 + 4n^2$. 2 marks

c. Simplify $x \times x \times x \times y$. 2 marks

d. If $m = 3$, evaluate $4m^2$. 2 marks

e. Simplify $\frac{18g^4h}{3gh}$. 2 marks

Question 3 (8 marks)

a. Consider the following table of values.

x	0	1	2
y	4	3	2

i. Complete the formula below for the table. 2 marks

$$y = \square + \square$$

ii. Find the value of y when x is 4. 2 marks

b. Consider the geometric pattern below made by squares.
Each square has a side length of 1 unit.

Pattern number 1 Pattern number 2 Pattern number 3

i. Find the perimeter of Pattern number 2. 1 mark

ii. What the perimeter of Pattern number 4? 1 mark

iii. Complete following rule for the perimeter of the nth pattern number. 2 marks

$$Perimeter = \square + \square \times n$$

2022 Year 8 Mathematics
Patterns and Algebra Test
Total marks: 35 marks

Question 1 (10 marks)

a. 2 marks

$k + k + k + k + k = 5k$

- The coefficient of the final expression is 5. (A1)
- The final expression contains k. (A1)

b. 2 marks

$2n^2 + 4n^2 = 6n^2$

- The coefficient of the final expression is 6. (A1)
- The final expression contains n^2. (A1)

c. 2 marks

$x \times x \times x \times y = x^3y$

- The final expression contains x and y. (A1)
- The powers of x and y are 3 and 1, respectively. (A1)

d. 2 marks

$4m^2 = 4(3)^2$ (A1)

$= 36$ (A1)

e. 2 marks

$$\frac{18g^4h}{3gh} = 6g^3$$

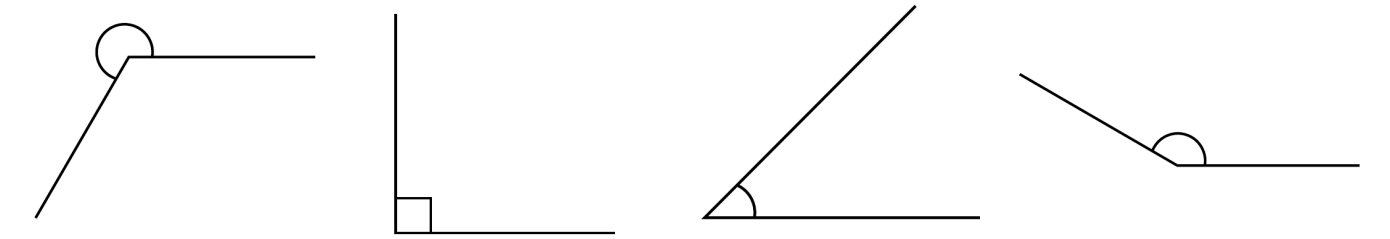
- The coefficient of the final expression is 6. (A1)
- The final expression contains g^3. (A1)

2022 Year 8 Mathematics
Geometry Test

Time allowed: 1 hour
Total marks: 35 marks

Question 1 (7 marks)

a. The following four angles are drawn to scale. 4 marks



Label each angle above by writing down correct name from the box below.

Right angle
Revolution
Acute angle
Obtuse angle
Reflex angle

b. Write down the sum of the angles at a point. 1 mark

_____

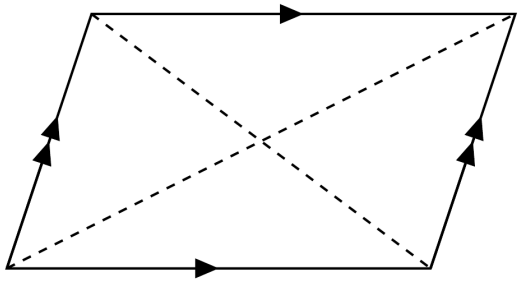
c. x^o and 42^o are complementary angles. 2 marks
Find the value of x.

_____

_____

Question 3 (9 marks)

a. 4 marks



Complete the following paragraph about a parallelogram.

Opposite sides are _____ and _____. Opposite angles are _____.
The diagonals _____ each other.

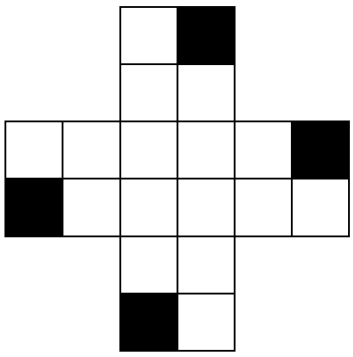
b. What is the sum of the interior angles of a parallelogram? 1 mark

_____

c. In a particular parallelogram, suppose that all pairs of adjacent sides are perpendicular. 1 mark
Write down the name of this parallelogram.

_____

d. Consider the following shape.



i. Draw all axes of symmetry on the diagram above. 2 marks

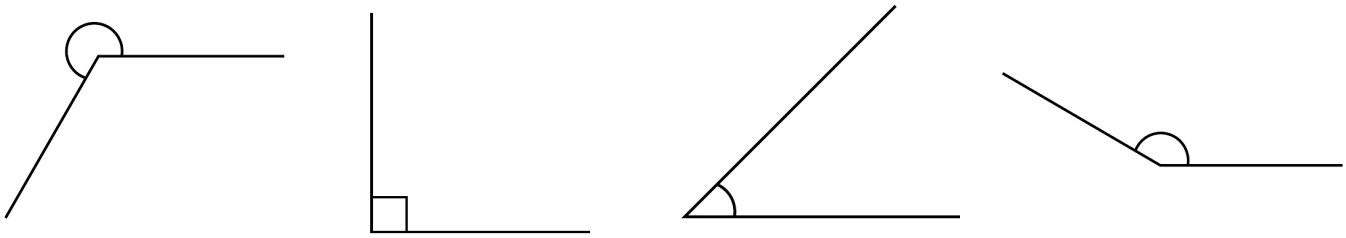
ii. Write down the order of rotational symmetry for the shape above. 1 mark

_____

2022 Year 8 Mathematics
Geometry Test
Total marks: 35 marks

Question 1 (7 marks)

a. 4 marks



Reflex angle (A1)	Right angle (A1)	Acute angle (A1)	Obtuse angle (A1)

b. 1 mark

360º (A1)

c. 2 marks

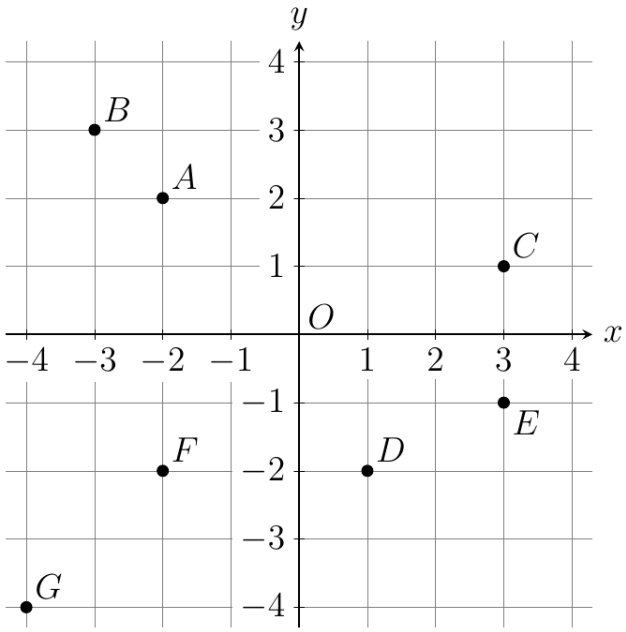
$x + 42 = 90$ (A1)
Therefore, $x = 48$. (A1)

- Accept $x = 90 - 42 = 48$.

2022 Year 8 Mathematics
Linear Relationships Test

Time allowed: 1 hour
Total marks: 35 marks

Question 1 (5 marks)
Seven points (A to G) are plotted on the number plane shown below.



a. Write down the coordinates of the origin. 1 mark

_____

b. Which point has the same x-coordinate as point A? 1 mark

_____

c. Write the equation of the horizontal line that passes through points D and F. 1 mark

_____

d. Which point corresponds to the image of reflecting point C in the x-axis? 1 mark

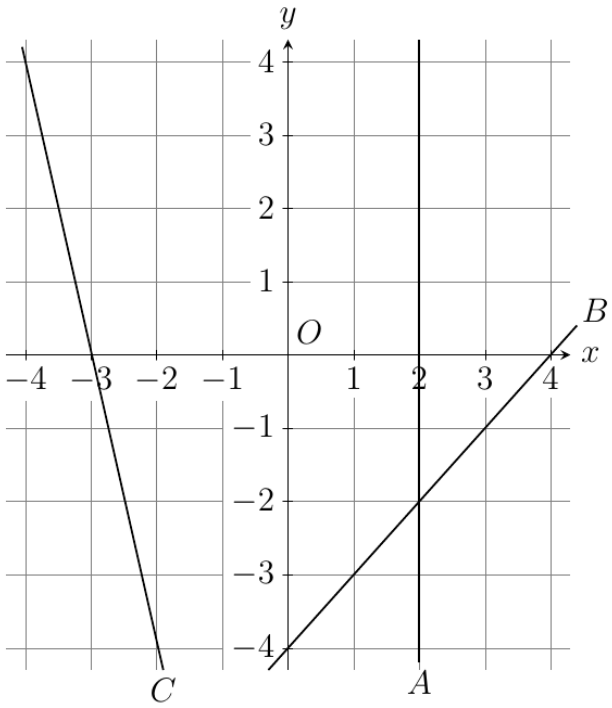
_____

e. Which quadrant does point G lie in? 1 mark
Circle the correct answer.

1st quadrant 2nd quadrant 3rd quadrant 4th quadrant

Question 4 (8 marks)

a. Consider three straight lines A, B and C shown below.



i. Find the equation of line A. 1 mark

ii. Find the slope of line B. 1 mark

iii. Find the equation of line B. 1 mark

iv. Which quadrant does line C lie in? 2 marks
Circle **all** of the correct answers.

1st quadrant 2nd quadrant 3rd quadrant 4th quadrant

2022 Year 8 Mathematics
Linear Relationships Test
Total marks: 35 marks

Question 1 (5 marks)

a. 1 mark
$(0, 0)$ (A1)

b. 1 mark
F (A1)

c. 1 mark
$y = -2$ (A1)

d. 1 mark
E (A1)

e. 1 mark
3rd quadrant (A1)

Question 2 (7 marks)

a. 1 mark
True (A1)

b. 1 mark
False (A1)

c. 1 mark
True (A1)

d. 1 mark
False (A1)

e. 1 mark
True (A1)

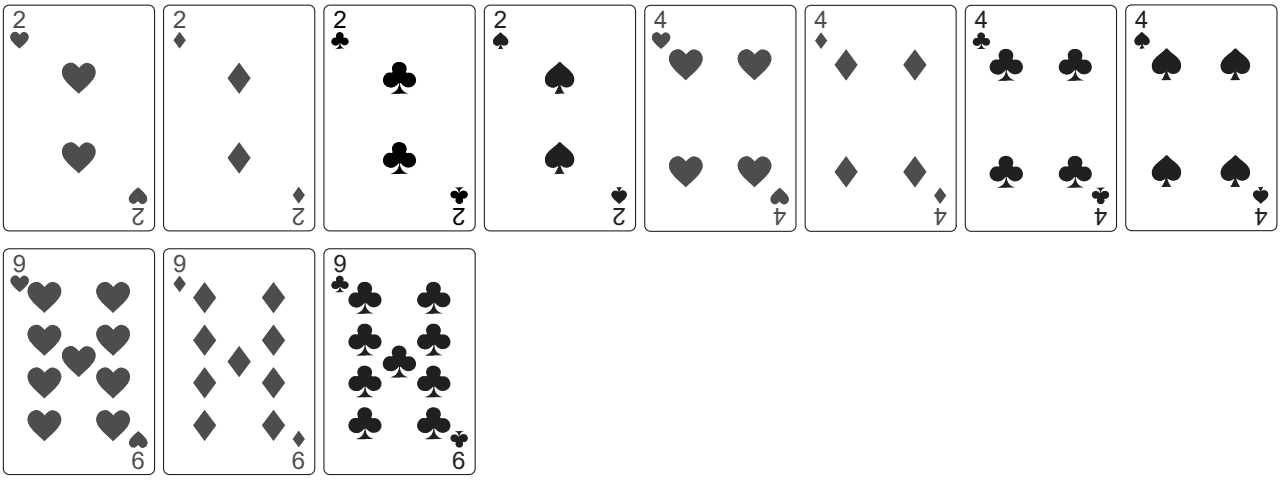
f. 1 mark
False (A1)

g. 1 mark
True (A1)

2022 Year 8 Mathematics
Probability Test

Time allowed: 1 hour
Total marks: 25 marks

Question 1 (7 marks)
The cards shown below are put in a stack and shuffled.



a. How many cards are there? 1 mark

_____

b. How many hearts are in the stack? 1 mark

_____

c. One card is chosen without looking.

i. Find the probability of choosing an even numbered card. 1 mark

_____

ii. Find the probability of choosing a club or a diamond. 1 mark

_____

iii. Find the probability of choosing an Ace. 1 mark

_____

iv. Is choosing a heart as likely as choosing a diamond? 2 marks
Justify your answer.

_____

_____

2022 Year 8 Mathematics
Probability Test
Total marks: 25 marks

Question 1 (7 marks)

a. 1 mark

11 (A1)

b. 1 mark

3 (A1)

c.

i. 1 mark

$\frac{8}{11}$ (A1)

ii. 1 mark

$\frac{6}{11}$ (A1)

iii. 1 mark

0 (A1)

iv. 2 marks

Yes (A1)

There are an equal number of hearts and diamonds. (A1)

2022 Year 8 Mathematics
Statistics Test

Time allowed: 1 hour
Total marks: 25 marks

Question 1 (7 marks)

a. State two advantages of sampling over census. 2 marks

_____

_____

b. A researcher wants to determine how long it takes for people to complete a hiking course. 3 marks
Complete the following paragraph by writing down the appropriate word in each gap.

The researcher will select a _____ sample of people who completed the hiking course.
This sample will then be analysed in order to estimate the _____ time it takes for people to complete the hiking course.
Conducting a _____ in this case seems unrealistic.

c. Part of a survey questionnaire is shown below: 2 marks

What fast food did you eat last month?

Tick an answer below

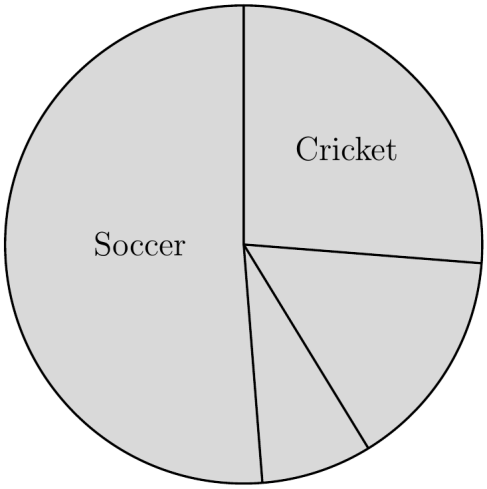
Burger	
Fried chicken	
Mexican	
Pizza	

State two limitations of this questionnaire.

_____

_____

f. The data is represented by a sector graph as shown below.
Some parts of the sector graph are not labelled.



i. Complete labelling the sector graph. 1 mark

ii. Name two other graphs that can used to represent the same data instead of a sector graph. 2 marks

_____

_____

2022 Year 8 Mathematics
Statistics Test
Total marks: 25 marks

Question 1 (7 marks)

a. 2 marks

Possible advantages include:
- simple
- quick
- inexpensive

● Two valid advantages. (A1)×2

b. 3 marks

random (A1)
true or actual (A1)
census (A1)

c. 2 marks

Possible answers include:
- There are not enough options (could include more options such as “had no fast food”)
- The questionnaire requires recalling some information from last month, which could be difficult.

● Two valid limitations. (A1)×2

2022 YEAR 8 MATHEMATICS

MIDYEAR TEST

Reading time: 15 minutes
Writing time: 2 hours

QUESTION BOOK

Structure of book

Section	Number of questions	Number of questions to be answered	Number of marks
A	15	15	15
B	5	5	25
C	2	2	20
			Total 60

SECTION A

Instructions for Section A

Answer **all** questions.
Choose the response that is **correct** for the question.
A correct answer scores 1, an incorrect answer scores 0.
Marks will **not** be deducted for incorrect answers.
No marks will be given if more than one answer is completed for any question.

Question 1

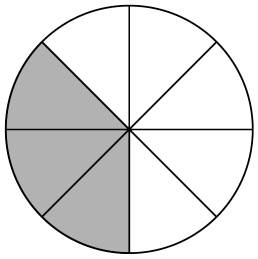
$2 \times ((3 - 1) - 1)$ evaluates to

A. –2
B. 0
C. 1
D. 2

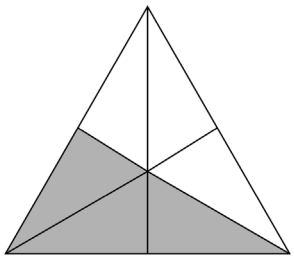
Question 2

The shape that does **not** have 37.5% of its area shaded is

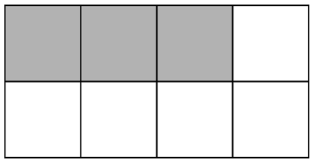
A.



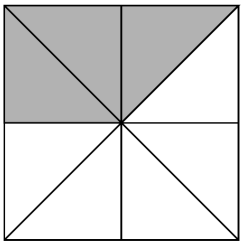
B.



C.



D.



Question 9

n	6	0	–4
T	–1	2	4

The correct rule that relates T and n for the table of values shown above is

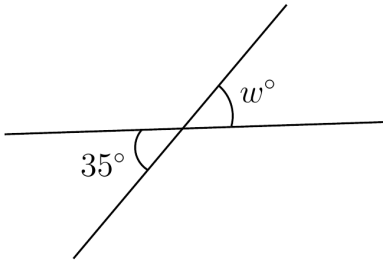
A. $T = 2 - 2n$

B. $T = 4 - 2n$

C. $T = 2 - \frac{n}{2}$

D. $T = 2 + \frac{n}{2}$

Question 10



In the diagram above, $w = 35$ because w^o and 35^o are

A. vertically opposite angles

B. supplementary angles

C. at a point

D. complementary angles

Question 11

A quadrilateral with four equal sides is called a

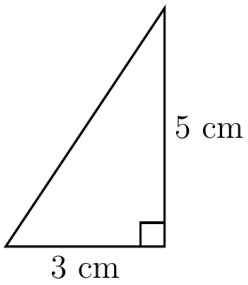
A. trapezium

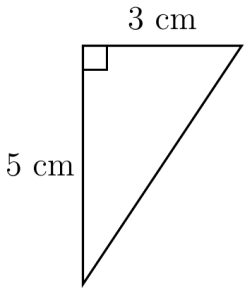
B. rhombus

C. parallelogram

D. rectangle

Question 12





The test that can be directly used to show that the triangles shown above are congruent is

A. SSS

B. RHS

C. AAS

D. SAS

Question 13

The solution to the equation $2(n - 2) = 20$ is

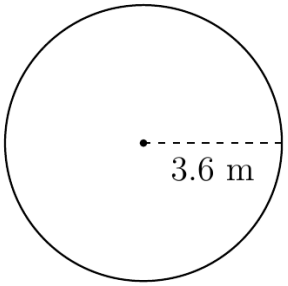
A. $n = 2$

B. $n = 8$

C. $n = 10$

D. $n = 12$

Question 14



The area of the circle above is closest to

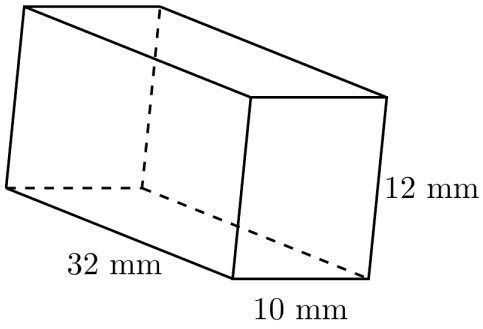
A. 11.3 m^2

B. 22.6 m^2

C. 40.7 m^2

D. 162.9 m^2

Question 15



The volume of the prism above, in cm^3, is

A. 1.648 cm^3

B. 3.84 cm^3

C. 1,648 cm^3

D. 3,840 cm^3

END OF SECTION A

SECTION B

Instructions for Section B

Answer **all** questions.
In all questions where a numerical answer is required, an **exact** value must be given unless otherwise specified.
In questions where more than one mark is available, appropriate working **must** be shown.
Unless otherwise indicated, the diagrams in this book are **not** drawn to scale.

Question 1 (5 marks)

a. Evaluate $2 + 7 - 3$. 1 mark

b. How many decimal places does the number 2.535 have? 1 mark

c. Simplify $3^5 \times 3^2$. 2 marks
Use index notation to express your answer.

d. Evaluate $\sqrt{900}$. 1 mark

Question 3 (5 marks)
Part of the route 343 bus timetable is shown below.
All times are shown as 24-hour times.

343 Kingsford to Central Station				
Monday to Friday				
Dacey Gardens	2300	2315	2330	2345
Lakes Hotel	2303	2318	2333	2348
Harcourt Parade	2305	2320	2335	2350
Rothschild Avenue	2307	2322	2337	2352
Elizabeth Street	2309	2324	2339	2354
Chalmers Street	2314	2329	2344	2359
Central Station	2317	2332	2347	0002

a. Convert 2300 to 12-hour time. 1 mark

_____

b. How many minutes would the 343 bus take to travel from Dacey Gardens to Central Station? 1 mark

_____

c. If Nathan boards the 343 bus from Lakes Hotel at 2318, where will he be at 2329? 1 mark

_____

d. Mary boards the 343 bus from Rothschild Ave at 2352 on Wednesday. 2 marks
What will be the time (in 12-hour time) and day when she arrives at Central Station?

_____

_____

SECTION C

Instructions for Section C

Answer **all** questions.
In all questions where a numerical answer is required, an **exact** value must be given unless otherwise specified.
In questions where more than one mark is available, appropriate working **must** be shown.
Unless otherwise indicated, the diagrams in this book are **not** drawn to scale.

Question 1 (10 marks)
The table shows student enrolment across two year levels at a secondary school in 2021.

Year Level	Year 7	Year 8
Enrolment	255	285

a. Show that the total number of Year 7 and Year 8 students is 540. 1 mark

b. In Year 7, the ratio of the number of boys to the number of girls is 2:3. 2 marks
Find the number of boys and the number of girls in Year 7.

c. In Year 8, $\frac{1}{5}$ of the students catch the tram to school, $\frac{3}{5}$ walk to school, and the rest catch the bus. 2 marks

Find the number of Year 8 students who catch the bus to school.

e. Describe how the graph shows that the rate at which Saloni used data in the first 2 days is greater than the rate at which she used data in the last 2 days. 2 marks

_____

_____

_____

f. Terry also used some data during the same 8-day period as Saloni. 2 marks
Initially, Terry had already used 15 GB of data. He then used data at a constant rate, making his overall data usage 30 GB by the end of the 8th day.

Sketch the graph that represents Terry's data usage on the set of axes given on the previous page.

END OF QUESTION AND ANSWER BOOK

SOLUTIONS

SECTION A

Question	Answer
1	D
2	B
3	C
4	A
5	D
6	C
7	B
8	A
9	C
10	A
11	B
12	D
13	D
14	C
15	B

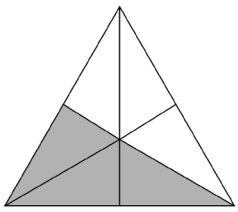
Question 1

$2 \times ((3 - 1) - 1) = 2 \times 1 = 2$

Answer is **D**.

Question 2

The following shape has 50% of its areas shaded.



All others shapes have 37.5% or 3/8, of their areas shaded.

Answer is **B**.

Question 3

The numbers –5 and 10 are 5 marks apart, so each mark on the number line represents $(10 - (-5)) \div 5 = 3$.
Therefore, the number that corresponds to *C* is $-5 + 3 \times 3 = 4$.

Answer is **C**.

Question 5 (5 marks)

a. 1 mark

Trapezium (A1)

● Accept quadrilateral.

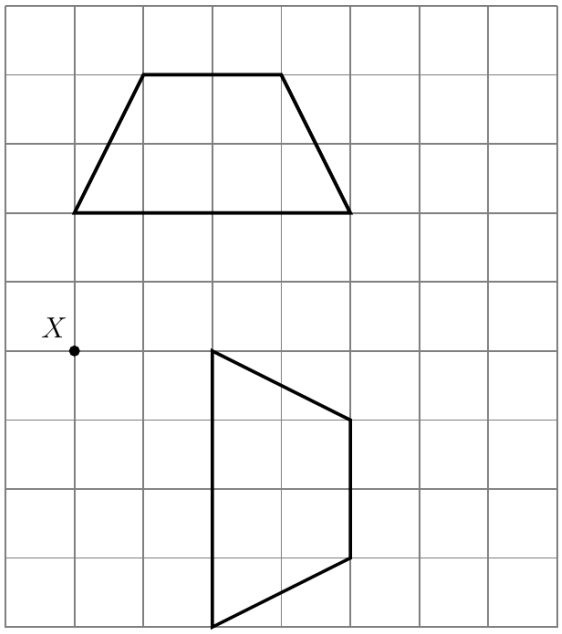
b. 2 marks

The area of the shape is

$\frac{1}{2} \times (2+4) \times 2$ (A1)

$= 6$ units^2 (A1)

c. 2 marks



● Correct rotated shape. (A1)×2