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HUA YI SECONDARY SCHOOL

SUMMATIVE REVIEW 2024

1-G3

NAME

CLASS

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INDEX
NUMBER

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MATHEMATICS PAPER

4052

02 October 2024

2 hours 15 minutes

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your Name, Class and Index Number in the spaces provided at the top of this page.

Write in dark blue or black pen.

You may use an HB pencil for any diagrams or graphs.

Do not use staples, paper clips, glue or correction fluid.

Answer **all** questions in **Section A** and **Section B**.

The number of marks is given in brackets [] at the end of each question or part question.

If working is needed for any question it must be shown with the answer.

Omission of essential working will result in loss of marks.

The total of the marks for this paper is 90.

The use of an approved scientific calculator is expected, where appropriate.

If the degree of accuracy is not specified in the question, and if the answer is not exact, give the answer to three significant figures. Give your answers in degrees to one decimal place.

For π , use either your calculator value, or 3.142.

For Examiner's
Use

90

[Turn Over]

Section A (45 marks)

- 1 (a) Write the following in order of size, starting with the smallest.

$$0.\dot{2}\dot{3}, \quad \frac{\pi}{2}, \quad -2, \quad \frac{3}{5}, \quad (-1)^2, \quad -0.295$$

Answer [2]
Smallest Largest

- (b) Express $12\frac{3}{4}\%$ as a fraction in its simplest form.

Answer [1]

- 2 By rounding each number to 2 significant figures, estimate the value of

$$\frac{234.99 \times \sqrt[3]{30}}{29.545}$$

Show your working clearly.

Answer [2]

- 3 The diagram shows two bottles of detergent with different sizes.



Medium size
2.6 litres
\$8.31



Large size
4 litres
\$12.82

Which size of the detergent gives the better value?

You must show all your working clearly.

Answer The size detergent gives a better value because

..... [2]

-
- 4 Jessie is playing with 324 cubes.
She uses all 324 cubes to make a cuboid of different dimensions.
Each of the sides of the cuboid is made up of more than 2 cubes.
Find the number of cubes on each side of the cuboid.

Answer cubes by cubes by cubes [2]

- 5 Benny cycled at a constant speed of 16 km/h for 1 hour 30 minutes from Town *A* to Town *B*. He then stopped and rested for 30 minutes at Town *B*. After that, he cycled from Town *B* to Town *A* at a constant speed of 12 km/h.
Calculate the average speed of his entire journey.

Answer km/h [3]

- 6 (a) Express 576 as a product of its prime factors.
Leave your answer in index notation.

Answer [2]

- (b) Using your answer to (a), explain why 576 is a perfect square.

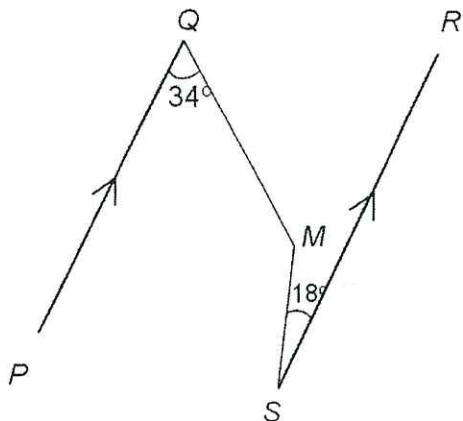
Answer
..... [1]

- (c) Given that m and n are non-zero whole numbers,
find the values of m and n so that $576 \times \frac{m}{n}$ is a perfect cube.

Answer $m =$

$n =$ [1]

- 7 In the diagram, PQ is parallel to RS .
 Angle $PQM = 34^\circ$ and angle $MSR = 18^\circ$.
 Find the obtuse angle QMS .
 Support your working with reasons.



Answer obtuse angle $QMS = \dots\dots\dots^\circ$ [3]

- 8 (a) Expand and simplify $4[p - (3 + 2q)] - 7q + 6p$.

Answer $\dots\dots\dots$ [2]

- (b) Solve the equation $3y - 7 = 15 - y$.

Answer $y = \dots\dots\dots$ [2]

9 Factorise the following expressions completely.

(a) $24pq^2 - 56q^3$

Answer [1]

(b) $2a(x+5) - 6b(x+5)$

Answer [2]

10 The first four terms of a sequence are 18, 25, 32, 39.

(a) Find and simplify an expression, in terms of n , for the n th term of the sequence.

Answer [1]

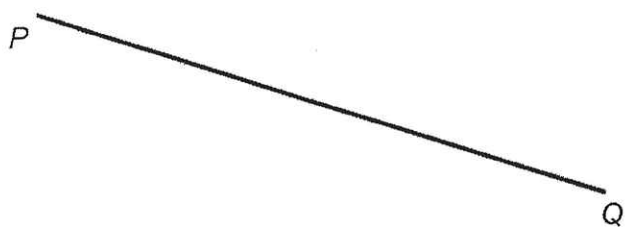
(b) Explain why 330 is not a possible term in the sequence.

Answer

..... [2]

- 11 (a) Construct a quadrilateral $PQRS$ where $QR = 8.9$ cm, $PS = 10.2$ cm, angle $PQR = 113^\circ$ and angle $SPQ = 67^\circ$.
The side, PQ , has been drawn for you.

Answer



[2]

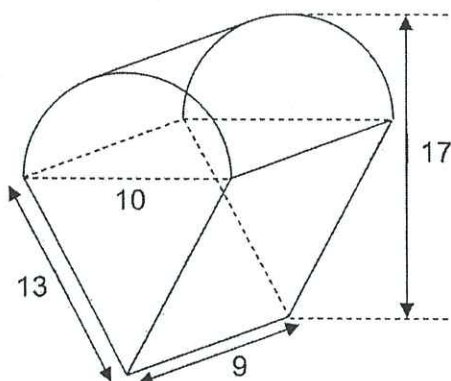
- (b) What is the geometric name of the quadrilateral $PQRS$?

Answer [1]

- (c) Measure and write down the length of the diagonal PR .

Answer cm [1]

12



The figure shows a container made up of a right triangular prism and a half cylinder.
 The container has a length of 9 cm.
 The uniform cross-section consists of a semicircle of diameter 10 cm and an isosceles triangle with two of its sides having a length of 13 cm.
 The height of the container is 17 cm.

- (a) Find the cross-sectional area, correct to 2 decimal places.

Answer cm^2 [3]

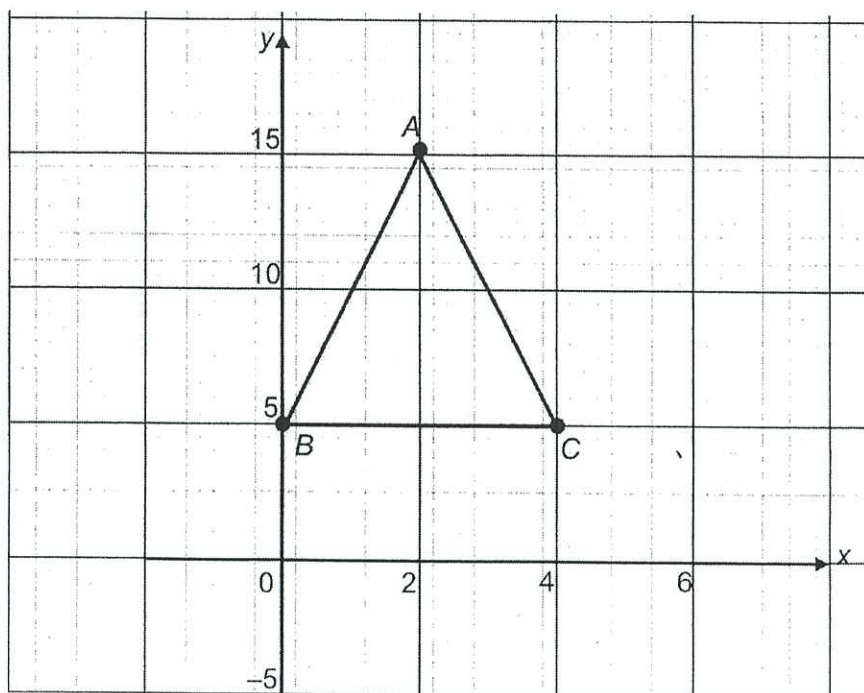
- (b) Find the volume of water the container can hold.
 Leave your answer in litres.

Answer litres [2]

-
- (c) Find the total surface area of the container.

Answer cm^2 [3]

- 13 The diagram shows triangle ABC .



- (a) Find the gradient of the AB .
Show your working clearly.

Answer [2]

- (b) Write down the equation of AB .

Answer [1]

- (c) Another triangle BCD has the same area as triangle ABC .
State the possible coordinates of point D .

Answer D (.....,) [1]

Section B (45 marks)

14 The interior angle of a regular polygon is 7 times of its exterior angle.

(a) Find the size of each interior angle of the regular polygon.

Answer ° [2]

(b) Find the number of sides of the regular polygon.

Answer [2]

- 15 Johan, Mary, and Susan sold an authentic art piece in an auction at the value of \$20 000.
After the sales, Johan received \$ x .
Mary received \$1 000 less than twice the amount that Johan received.
Susan received 25% less than the amount that Johan received.

(a) Express the ratio of money received by Johan compared to Susan.

Answer : [1]

(b) By finding the value of x , determine who received the most amount of money and the amount he / she received.

Answer received \$ [3]

(c) Find the percentage of money received by Mary in the sale of this art piece.

Answer % [1]

- 16 (a) Given that $a = 3$, $b = 5$ and $c = -1$, find the value of $-a(b-c) + ab^2c$.

Answer [1]

(b) Solve $\frac{3d+5}{2} = -7$.

Answer $d =$ [2]

(c) Solve $\frac{3e-7}{2} - \frac{e-11}{6} = 5$.

Answer $e =$ [3]

- 17 (a) Ammar plans to purchase a house in the outskirts of Australia.
It is given that the conversion rate between Singapore Dollars (SGD) to Australian Dollars (AUD) is 1 SGD = 1.12 AUD.
The house is priced at 800 000 AUD.

Find the amount in Singapore Dollars, leaving your answers correct to the nearest thousand.

Answer SGD [2]

- (b) A bank offers two types of loan schemes to all eligible clients who want to take a personal loan. The two loan schemes are shown in the table below.

Scheme A	Processing fee of \$300. Simple interest rate of 5.73% per annum.
Scheme B	No processing fee required. Simple interest rate of 5.8% per annum.

Ammar would like to take a loan of 500 000 SGD for 5 years.

Which scheme should he choose?

Explain your answer based on appropriate calculations.

Answer

.....
..... [3]

-
- 18 There are two platforms in a train station.
The trains on platform A enter the station every 12 minutes, while the trains on platform B enter the station every 21 minutes.

(a) The trains on both platforms entered the station together at 0730. What time will the trains on both platforms enter the station together again?

Answer [2]

(b) The train station operates from 0730 to 2130 daily. How many times in a day will the trains on both platforms enter the station together?

Answertimes [2]

-
- 19 (a) Given that the first number in a set of three consecutive even numbers is x , express the average of the three numbers in terms of x .

Answer [2]

(b) The sum of any two composite number will **always** be a composite number.
Do you agree with the statement? Explain.

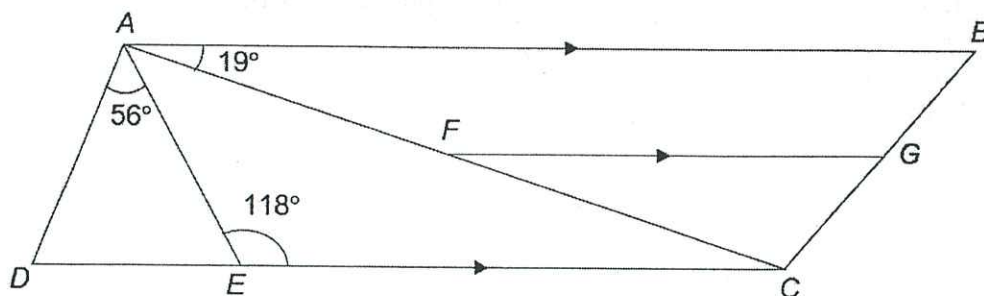
Answer

.....

.....

..... [1]

- 20 In the diagram, DEC is a straight line. AB is parallel to FG and DC . Angle $DAE = 56^\circ$, angle $AEC = 118^\circ$, and angle $BAC = 19^\circ$.



(a) Stating your reasons clearly, find

(i) angle ADE , and

Answer $^\circ$ [2]

(ii) angle CAE .

Answer $^\circ$ [1]

(b) It is given that angle $FGC = x^\circ$.

Find angle ACB in terms of x , stating your reasons clearly.

Answer $^\circ$ [2]

(c) Explain why triangle ADE is an isosceles triangle.

Answer

.....

.....

[1]

- 21 In a macaron recipe, every 12 macarons require the following amount of ingredients.

Ingredients	Mass required (in grams)
flour	65
powdered sugar	65
caster sugar	45
egg whites	50

- (a) Calculate the percentage of the mass of egg whites in each macaron.

Answer% [2]

- (b) Julari received an order of 660 macarons from a customer.

If each egg is estimated to contain an average of 28 grams of egg white, calculate the minimal number of eggs needed in this order.

Answer [2]

(c) The price list of a store Julari purchases her eggs from is as shown below.

Items	Pricing
tray of 30 eggs	\$5.50
a dozen of eggs	\$2.50

Showing your working clearly, suggest the most cost-effective way that Julari should purchase the eggs required for the order in (b) assuming that she wants to have as few eggs left over as possible, and calculate the total cost price of the eggs.

Answer

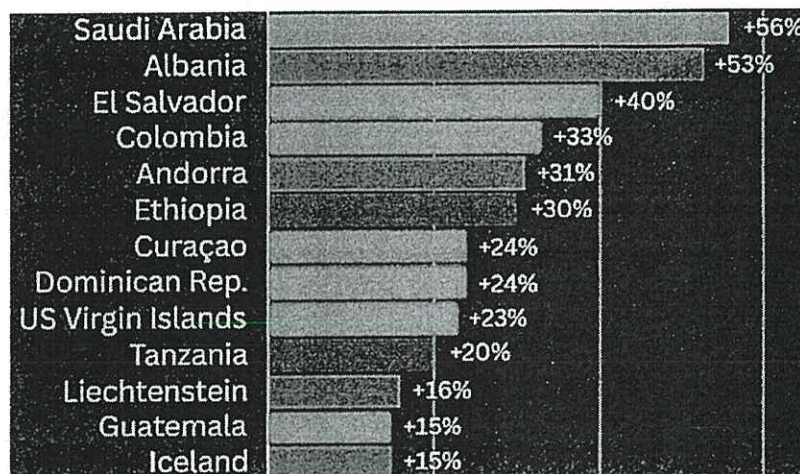
Julari should purchase

.....

Total cost price of eggs = \$

[3]

- 22 The bar graph shows the increase in international tourists' arrivals in 2023 compared to 2019 in a few countries.



Adapted from <https://wptravel.io/world-tourism-ranking-by-country/>

- (a) Amelina says that the bar graph shows the increase in international tourists' arrivals in Ethiopia is twice that of Iceland.

Do you agree with Amelina? Explain your answer clearly.

Answer

.....
 [1]

- (b) The table below shows the total international tourists' arrivals of Saudi Arabia in 2023.

Country	Region	Arrivals (million)
Saudi Arabia	Middle East	27.42

Adapted from <https://wptravel.io/world-tourism-ranking-by-country/>

Calculate the total international tourists' arrivals of Saudi Arabia in 2019.

Answer million [2]

- (c) International visitor arrivals (IVA) reached 13.6 million in 2023. In Singapore, visitor arrivals were driven by strong demand from a mix of Singapore's key markets, led by Indonesia (2.3 million), China (1.4 million) and Malaysia (1.1 million). Calculate the fraction of China visitors to the total international visitor arrivals of Singapore in 2023.

Answer

[1]

- (d) Singapore's tourism receipts reached \$20.1 billion between January to September 2023. For the first nine months of 2023, the top tourism receipts generating markets were China, Indonesia and Australia, which contributed \$2.3 billion, \$2.2 billion, and \$1.5 billion respectively in tourism receipts. Calculate the percentage of Singapore's tourism receipts that were generated by China in the first nine months of 2023 in Singapore.

Answer % [1]

Above adapted from <https://www.stb.gov.sg/content/stb/en/media-centre/media-releases/Singapores-tourism-sector-posts-strong-recovery-in-2023-exceeds-forecasts-for-tourism-receipts.html.html>

End of Paper



HUA YI SECONDARY SCHOOL

SUMMATIVE REVIEW 2024

1-G3

NAME

CLASS

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INDEX
NUMBER

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MATHEMATICS PAPER

02 October 2024

2 hours 15 minutes

Additional Materials: Nil

ANSWER SCHEME

(as of 03 October 2024)

This document consists of **19** printed pages.

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Setter: Ms Shirlynn Khoo

Section A

- 1 (a) Write the following in order of size, starting with the smallest.

Wont penalise for
equivalent values given

$$0.\dot{2}\dot{3}, \quad \frac{\pi}{2}, \quad -2, \quad \frac{3}{5}, \quad (-1)^2, \quad -0.295$$

B1 for 1 error

Award 0m for 3 errors or more

Answer [2]

Smallest Largest

- (b) Express $12\frac{3}{4}\%$ as a fraction in its simplest form.

$$\frac{12\frac{3}{4}}{100} = \frac{51}{400}$$

Answer [1]

$\frac{51}{400}$ B1

- 2 By rounding each number to 2 significant figures, estimate the value of

$$\frac{234.99 \times \sqrt[3]{30}}{29.545}$$

Show your working clearly.

$$\frac{230 \times \sqrt[3]{27}}{30} = 23$$

– M1 (all 3 correct), A1

Answer [2]

- 3 The diagram shows two bottles of detergent with different sizes.



Medium size
2.6 litres
\$8.31



Large size
4 litres
\$12.82

Which size of the detergent gives the better value?

You must show all your working clearly.

Medium Size – Cost //

$$\frac{8.31}{2.6}$$

= \$3.196 //

Large Size – Cost //

$$\frac{12.82}{4}$$

= \$3.205 //

M1

Answer The medium size detergent gives a better value because
..... it is cheaper per litre. A1 (ecf)

[2]

- 4 Jessie is playing with 324 cubes.

She uses all 324 cubes to make a cuboid of different dimensions.

Each of the sides of the cuboid is made up of more than 2 cubes.

Find the number of cubes on each side of the cuboid.

$$324 = 2^2 \times 3^4$$

$$= 4 \times 3 \times 27$$

M1
A1/ B2

Or any other logical
answers

e.g. $3 \times 9 \times 12$

$$3 \times 6 \times 18$$

Answer 4..... cubes by 3..... cubes by 27..... cubes [2]

- 5 Benny cycled at a constant speed of 16 km/h for 1 hour 30 minutes from Town A to Town B.
He then stopped and rested for 30 minutes at Town B.
After that, he cycled from Town B to Town A at a constant speed of 12 km/h.

Calculate the average speed of his entire journey.

$$\text{Dist from Town A to B} = 16 \times 1.5$$

$$= 24 \text{ km}$$

M1

$$\text{Time from Town B to Town A} = \frac{24}{12} = 2 \text{ h}$$

M1 (ecf)

$$\text{Average speed} = \frac{\text{Total dist}}{\text{Total time}}$$

$$= \frac{24 \times 2}{4}$$

$$= 12 \text{ km / h}$$

A1

Answer km/h [3]

- 6 (a) Express 576 as a product of its prime factors.
Leave your answer in index notation.

2	576	M1
2	286	
2	144	
2	72	
2	36	
2	18	
3	9	
3	3	
	1	

Answer $2^6 \times 3^2$ A1 [2]

- (b) Using your answer to **part (a)**, explain why 576 is a perfect square.

Answer The index of each prime factor of 576 is even, hence 576 is a perfect square. B1 [1]

- (c) Given that m and n are non-zero whole numbers,
find the values of m and n so that $576 \times \frac{m}{n}$ is a perfect cube.

Or any other logical answers

e.g.

m = any perfect cube and

n = 9

m = 3, n = 1

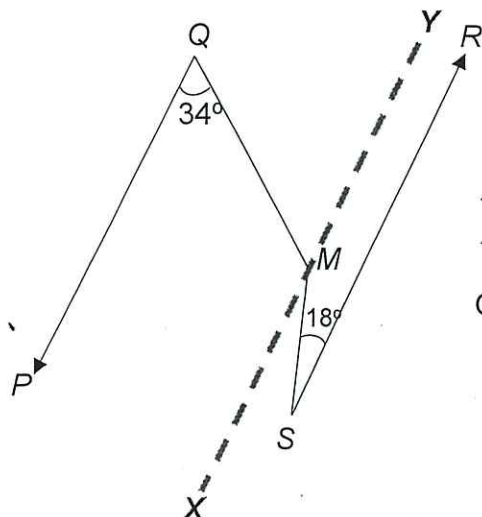
Answer m = 3
 n = 8 B1 [1]

- 7 In the diagram, PQ is parallel to RS .

$$\angle PQM = 34^\circ \text{ and } \angle MSR = 18^\circ.$$

Find the obtuse angle QMS .

Support your working with reasons.



Deduct 1 mark overall from paper if
Qns 7 and 20 have

- 1) missing/wrong reasons
- 2) no stating of angles in working

$$\angle QMX = 180^\circ - 34^\circ = 146^\circ \text{ (int. } \angle\text{s, } QP \parallel XY)$$

M1

$$\angle XMS = 18^\circ \text{ (alt. } \angle\text{s, } XY \parallel SR)$$

M1

$$\text{Obtuse } \angle QMS = 146^\circ + 18^\circ = 164^\circ$$

A1

Answer obtuse angle $QMS = \dots\dots\dots 164 \dots\dots\dots^\circ$ [3]

- 8 (a) Expand and simplify $4[p - (3 + 2q)] - 7q + 6p$.

$$4[p - (3 + 2q)] - 7q + 6p$$

$$= 4[p - 3 - 2q] - 7q + 6p$$

M1 for simplification of inner brackets

$$= 4p - 12 - 8q - 7q + 6p$$

$$= 10p - 15q - 12$$

A1

Answer $\dots\dots\dots 10p - 15q - 12 \dots\dots\dots$ [2]

- (b) Solve the equation $3y - 7 = 15 - y$.

$$3y - 7 = 15 - y$$

$$4y = 22$$

M1

$$y = 5\frac{1}{2} \text{ or } \frac{11}{2} \text{ or } 5.5$$

A1

Answer $y = \dots\dots\dots 5\frac{1}{2} \dots\dots\dots$ [2]

- 9 Factorise the following expressions completely.

(a) $24pq^2 - 56q^3$

$8q^2(3p - 7q)$ B1

Answer $8q^2(3p - 7q)$ [1]

(b) $2a(x+5) - 6b(x+5)$

$2a(x+5) - 6b(x+5)$

$= (x+5)(2a - 6b)$ M1

$= 2(x+5)(a - 3b)$ A1

Answer $2(x+5)(a - 3b)$ [2]

- 10 The first four terms of a sequence are 18, 25, 32, 39.

- (a) Find and simplify an expression, in terms of n , for the n th term of the sequence.

$\begin{array}{c} +7 \\ \curvearrowright \\ 18, 25, 32, 39 \end{array}$

Answer $T_n = 7n + 11$ B1 [1]

- (b) Explain why 330 is not a possible term in the sequence.

$7n + 11 = 330$ M1

$7n = 319$

$n = 45\frac{4}{7}$

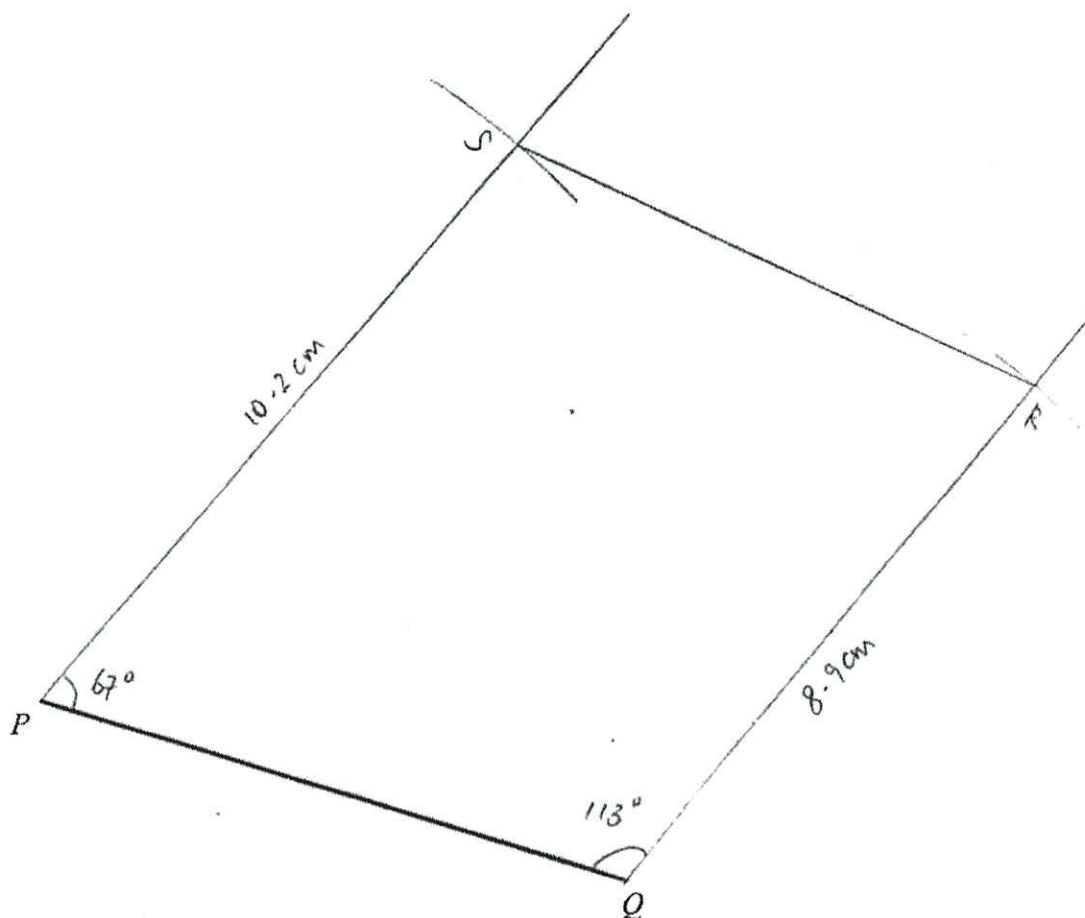
Answer 330 is not a term in the sequence as n is not an integer. A1

..... [2]

- 11 (a) Construct a quadrilateral $PQRS$ where $QR = 8.9$ cm, $PS = 10.2$ cm, angle $PQR = 113^\circ$ and angle $SPQ = 67^\circ$.

The side, PQ , has been drawn for you.

Answer



Both angles constructed correctly B1

Both lengths constructed correctly (with arcs) B1

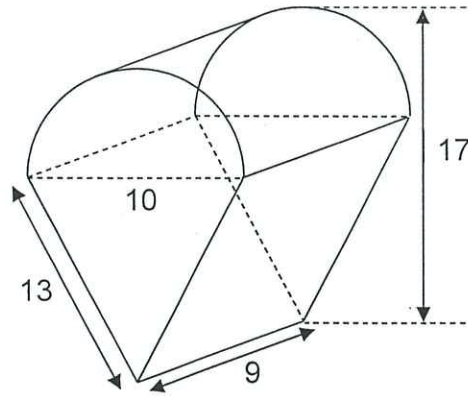
[2]

- (b) What is the geometric name of the quadrilateral $PQRS$?

Answer Trapezium B1 [1]

- (c) Measure and write down the length of the diagonal PR .

Answer 14.6 B1 cm [1]
(± 0.1)



The figure shows a container made up of a right triangular prism and a half cylinder.
 The container has a length of 9 cm.
 The uniform cross-section consists of a semicircle of diameter 10 cm and an isosceles triangle with two of its sides having a length of 13 cm.
 The height of the container is 17 cm.

- (a) Find the cross-sectional area, correct to 2 decimal places.

Area

$$= \frac{1}{2}\pi(5)^2 + \frac{1}{2}(10)(17-5) \quad \text{M2}$$

$$= 99.2699 \text{ cm}^2$$

$$= 99.27 \text{ cm}^2 \text{ (2dp)} \quad \text{A1}$$

Answer 99.27 cm² [3]

- (b) Find the volume of water the container can hold.

Leave your answer in litres.

Volume

$$= 99.2699 \times 9 \quad \text{M1 (ecf)}$$

$$= 893.429 \text{ cm}^3$$

$$= 0.893 \text{ l (3sf)} \quad \text{A1}$$

Answer 0.893 litres [2]

- (c) Find the total surface area of the container.

Total Surface Area

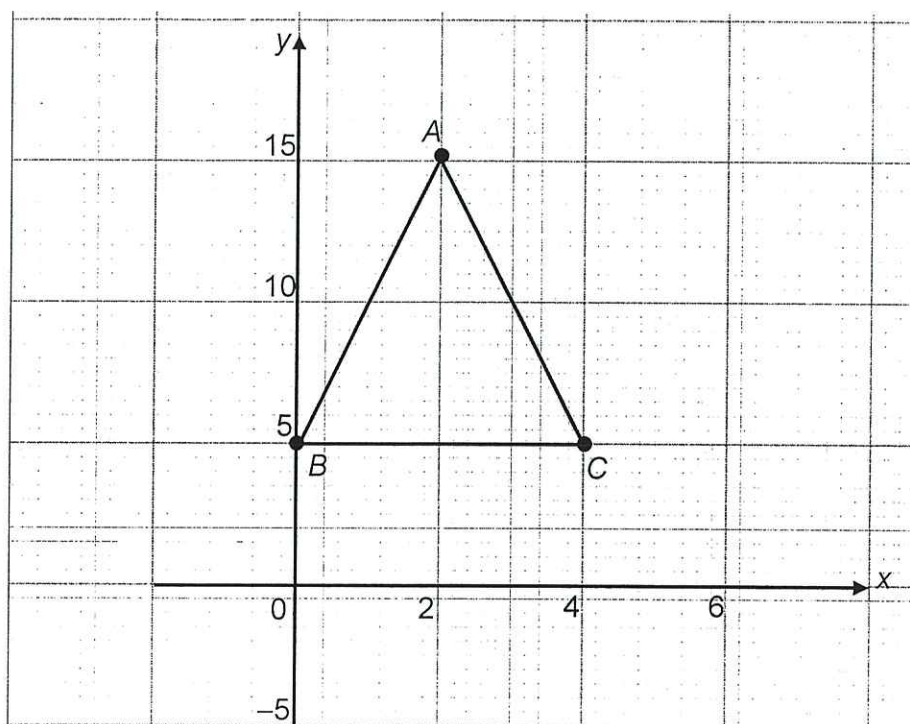
$$= 99.2699 \times 2 + 9 \times 13 \times 2 + 2\pi(5)(9)\left(\frac{1}{2}\right) \quad \text{M2 (M1 for every correct part)}$$

$$= 573.9114$$

$$= 574 \text{ cm}^2 \text{ (3sf)} \quad \text{A1}$$

Answer 574 cm² [3]

- 13 The diagram shows triangle ABC .



- (a) Find the gradient of the AB .
Show your working clearly.

Gradient

$$= \frac{10}{2} \quad \text{M1}$$

$$= 5 \quad \text{A1 / B2}$$

Answer 5 [2]

- (b) Write down the equation of AB .

Answer $y = 5x + 5$ B1 [1]

- (c) Another triangle BCD has the same area as triangle ABC .
State the possible coordinates of point D .

Or any reasonable answer

Answer $D(\dots\dots 4 \dots\dots, \dots\dots 15 \dots\dots)$ B1 [1]

Section B

- 14** The interior angle of a regular polygon is 7 times of its exterior angle.

(a) Find the size of each interior angle of the regular polygon.

$$8x = 180 \quad - \text{B1}$$

$$7x = 157.5 \quad - \text{B1}$$

Answer° [2]

(b) Find the number of sides of the regular polygon.

$$360 = 22.5n \quad - \text{M1}$$

$$n = 16 \quad - \text{A1}$$

$$180(n - 2) = 157.5n \quad - \text{M1}$$

$$22.5n = 360$$

$$n = 16 \quad - \text{A1}$$

Answer [2]

- 15 Johan, Mary, and Susan sold an authentic art piece in an auction at the value of \$20 000.
After the sales, Johan received \$ x .
Mary received \$1 000 less than twice the amount that Johan received.
Susan received 25% less than the amount that Johan received.

(a) Express the ratio of money received by Johan compared to Susan.

$$100 : 75 = 4 : 3 \quad - \text{B1}$$

Answer : [1]

(b) By finding the value of x , determine who received the most amount of money and the amount he / she received.

$$\begin{aligned}\text{Johan} &= x \\ \text{Mary} &= 2x - 1000 \\ \text{Susan} &= 0.75x\end{aligned}$$

$$\begin{aligned}3.75x - 1000 &= 20000 & - \text{M1} \\ 3.75x &= 21000 \\ x &= 5600 & - \text{M1}\end{aligned}$$

Mary received the most amount of \$10200. - A1 (ecf)

Answer received \$ [3]

(c) Find the percentage of money received by Mary in the sale of this art piece.

$$10200 / 20000 \times 100 = 51\% \quad - \text{B1}$$

Answer % [1]

- 16 (a) Given that $a = 3$, $b = 5$ and $c = -1$, find the value of $-a(b-c) + ab^2c$.

$$\begin{aligned} & -3(5+1) + 3(25)(-1) \\ & = -18 - 75 \\ & = -93 \end{aligned}$$

– B1

Answer [1]

- (b) Solve $\frac{3d+5}{2} = -7$.

$$3d + 5 = -14 \quad \text{– M1}$$

$$3d = -19$$

$$d = \frac{-19}{3} \quad \text{– A1}$$

Answer $d =$ [2]

- (c) Solve $\frac{3e-7}{2} - \frac{e-11}{6} = 5$.

$$\frac{3(e-7)}{6} - \frac{e-11}{6} = 5 \quad \text{– M1}$$

$$3(3e-7) - (e-11) = 30$$

$$9e - 21 - e + 11 = 30 \quad \text{– M1}$$

$$8e = 40$$

$$e = 5 \quad \text{– A1}$$

Answer $e =$ [3]

- 17 (a) Ammar plans to purchase a house in the outskirts of Australia.

It is given that the conversion rate between Singapore Dollars (SGD) to Australian Dollars (AUD) is 1 SGD = 1.12 AUD.

The house is priced at 800 000 AUD.

Find the amount in Singapore Dollars, leaving your answers correct to the nearest thousand.

$$\begin{aligned} 800\,000 / 1.12 & \quad - \text{M1} \\ = 714285.71428571 & \\ = 714000 \text{ SGD} & \quad - \text{A1} \end{aligned}$$

Answer SGD [2]

- (b) A bank offers two types of loan schemes to all eligible clients who want to take a personal loan. The two loan schemes are shown in the table below.

Scheme A	Processing fee of \$300. Simple interest rate of 5.73% per annum.
Scheme B	No processing fee required. Simple interest rate of 5.8% per annum.

Ammar would like to take a loan of 500 000 SGD for 5 years.

Which scheme should he choose?

Explain your answer based on appropriate calculations.

$$\begin{aligned} 5.73\% \times 500000 \times 5 + 300 &= 143550 & - \text{B1} \\ 5.8\% \times 500000 \times 5 &= 145000 & - \text{B1} \end{aligned}$$

Scheme A as the total interest + processing fee of Scheme A is lower than that of Scheme B. - B1 (ecf)

[3]

- 18 There are two platforms on a train station.
The trains on platform A enter the station every 12 minutes, while the trains on platform B enter the station every 21 minutes.

- (a) The trains on both platforms entered the station together at 0730. What time will the trains on both platforms enter the station together again?

$$\begin{aligned} 12 &= 2^2 \times 3 \\ 21 &= 3 \times 7 \\ \text{LCM} &= 2^2 \times 3 \times 7 \\ &= 84 && - \text{M1} \\ 0854 &&& - \text{A1} \end{aligned}$$

Answer [2]

- (b) The train station operates from 0730 to 2130 daily, how many times in a day will the trains on both platforms enter the station together?

$$14 \text{ hours} = 840 \text{ minutes} \quad - \text{M1}$$

$$\begin{aligned} 840 \text{ min} / 84 \text{ min} + 1 \\ = 11 \text{ times} &&& - \text{A1} \end{aligned}$$

Answer [2]

- 19 (a) Given that the first number in a set of three consecutive even numbers is x , express the average of three numbers in terms of x .

$$\begin{aligned} (x + x + 2 + x + 4) / 3 &&& - \text{M1} \\ = x + 2 &&& - \text{A1} \end{aligned}$$

Answer [2]

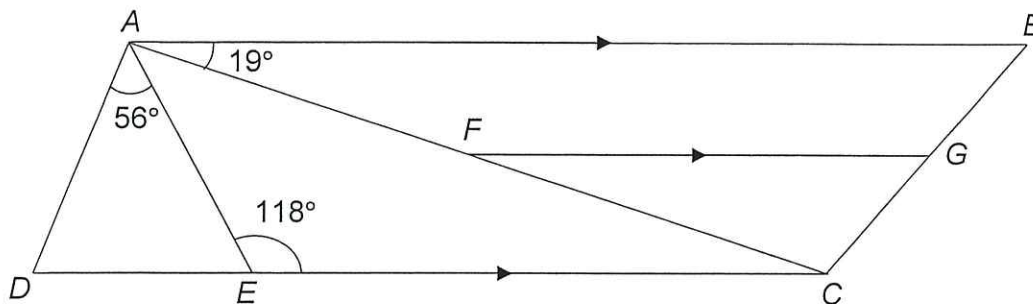
- (b) The sum of any two composite number will **always** be a composite number.
Do you agree with the statement? Explain.

Answer

I disagree, for instance 9 and 4 are both composite
numbers whose sum is a prime number 13. - B1
(need to give example)

[1]

- 20 In the diagram, DEC is a straight line.
 AB is parallel to FG and DC .
 Angle $DAE = 56^\circ$, angle $AEC = 118^\circ$, and angle $BAC = 19^\circ$.



(a) State your reasons clearly, find

(i) angle ADE , and

$$\begin{aligned} AED &= 180 - 118 \text{ (adj angle on a str line)} && - \text{M1} \\ &= 62 \\ ADE &= 180 - 56 - 62 \text{ (angle sum of triangle)} && - \text{A1} \\ &= 62 \end{aligned}$$

Answer $^\circ$ [2]

(ii) angle CAE .

$$\begin{aligned} CAE &= 180 - 62 - 56 - 19 \text{ (int angles, } DC \parallel AB) \\ &= 43 && - \text{B1} \end{aligned}$$

Answer $^\circ$ [1]

(b) It is given that angle $FGC = x^\circ$.

Find angle ACB in terms of x , stating your reasons clearly.

$$\begin{aligned} GFC &= 19 \text{ (corr angles, } FG \parallel AB) && - \text{M1} \\ ACB &= 180 - 19 - x \text{ (angle sum of triangle)} \\ &= 161 - x && - \text{A1} \end{aligned}$$

Answer $^\circ$ [2]

(c) Explain why triangle ADE is an isosceles triangle.

Answer

$$\begin{aligned} ADE &= AED \text{ (base angle of isos triangle)} && \dots\dots\dots \\ \text{Hence, triangle } ADE &\text{ is an isosceles triangle.} && - \text{B1} \end{aligned}$$

[1]

- 21 In a macaron recipe, every 12 macarons require the following amount of ingredients.

Ingredients	Mass required (in grams)
flour	65
powdered sugar	65
caster sugar	45
egg whites	50

- (a) Calculate the percentage of the mass of egg whites in each macaron.

$$50 / (65 + 65 + 45 + 50) \times 100 \quad - \text{M1}$$

$$= 22.2 \% \quad - \text{A1}$$

Answer% [2]

- (b) Julari received an order of 660 macarons from a customer.

If each egg is estimated to contain an average of 28 grams of egg white, calculate the minimal number of eggs needed in this order.

$$660 \div 12 \times 50 = 2750\text{g} \quad - \text{M1}$$

$$2750 / 28 = 98.2 \approx 99 \quad - \text{A1}$$

Answer [2]

- (c) The price list of a store Julari purchases her eggs from is as shown below.

Items	Pricing
tray of 30 eggs	\$5.50
a dozen of eggs	\$2.50

Showing your working clearly, suggest the most cost-effective way that Julari should purchase the eggs required for the order in (b) assuming that she wants to have as few eggs left over as possible, and calculate the total cost price of the eggs.

Answer

$$3 \text{ tray} + 1 \text{ dozen} = 102 \text{ eggs}$$

$$\rightarrow \$19 \quad - \text{M1}$$

$$2 \text{ tray} + 4 \text{ dozens} = 108 \text{ eggs}$$

$$\rightarrow \$21 \quad - \text{M1}$$

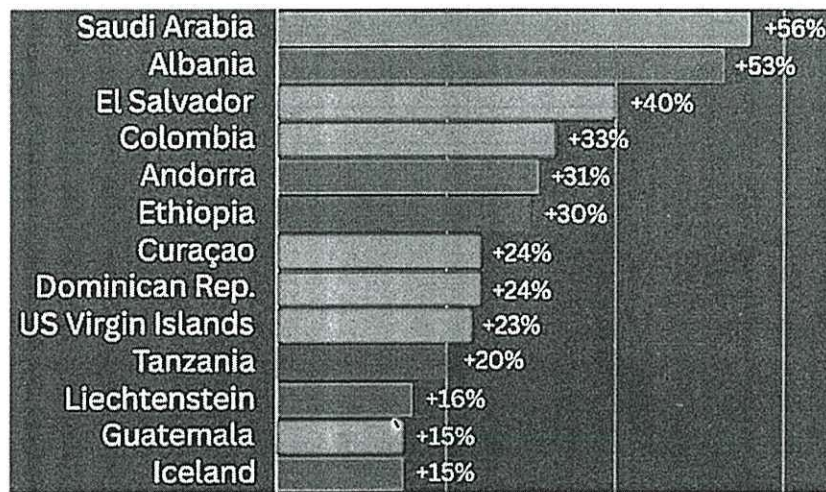
*give 1 combination only or 2 wrong comparisons + conclusion - 1m
*if only give 1 set of the correct working + answer (\$19) with conclusion - 3m

Julari should purchase 3 trays and 1 dozen of eggs.

[3]

Total cost price = \$19 - A1 (conclusion + cost price)

- 22 The bar graph shows the increase in international tourists' arrivals in 2023 compared to 2019 in a few countries.



Adapted from <https://wptravel.io/world-tourism-ranking-by-country/>

- (a) Amelina says that the bar graph shows the increase in international tourists' arrivals in Ethiopia is twice that of Iceland.

Do you agree with Amelina? Explain your answer clearly.

Answer

No, 15% increase of Iceland's ITA may not be half of 30% of Ethiopia's ITA.
Or

The number of ITA in Iceland and Ethiopia may not be the same, hence the increase in ITA in Ethiopia may not be twice of Iceland.

[1]

– B1

- (b) The table below shows the total international tourists' arrivals of Saudi Arabia in 2023.

Country	Region	Arrivals (million)
Saudi Arabia	Middle East	27.42

Adapted from <https://wptravel.io/world-tourism-ranking-by-country/>

Calculate the total international tourists' arrivals of Saudi Arabia in 2019.

$$27.42 \div 156 \times 100 \quad - \text{M1}$$

$$\approx 17.6 \text{ million} \quad - \text{A1}$$

Answer million [2]

- (c) International visitor arrivals (IVA) reached 13.6 million in 2023. In Singapore, visitor arrivals were driven by strong demand from a mix of Singapore's key markets, led by Indonesia (2.3 million), China (1.4 million) and Malaysia (1.1 million). Calculate the fraction of China visitors to the total international visitor arrivals of Singapore in 2023.

$$1.4 / 13.6 = 7 / 68 \quad - \text{ B1}$$

Answer

[1]

- (d) Singapore's tourism receipts reached \$20.1 billion between January to September 2023. For the first nine months of 2023, the top tourism receipts generating markets were China, Indonesia and Australia, which contributed \$2.3 billion, \$2.2 billion, and \$1.5 billion respectively in tourism receipts.

Calculate the percentage of Singapore's tourism receipts that were generated by China in the first nine months of 2023 in Singapore.

$$2.3 / 20.1 \times 100 = 11.4 \% \quad - \text{ B1}$$

Answer %

[1]

Adapted from <https://www.stb.gov.sg/content/stb/en/media-centre/media-releases/Singapores-tourism-sector-posts-strong-recovery-in-2023-exceeds-forecasts-for-tourism-receipts.html>