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Candidate Name	Form Class	Index Number
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**ANG MO KIO SECONDARY SCHOOL
END-OF-YEAR EXAMINATION 2022
SECONDARY ONE EXPRESS**

MATHEMATICS
Paper 1

4052/01
10 October 2022
1 hour 15 minutes

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your class, index number and name on all the work you hand in.
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.

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 50.

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 answers in degrees to one decimal place.
For π , use either your calculator value or 3.142.

For Examiner's Use
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This document consists of **14** printed pages.

Answer **all** the questions.

- 1 (a) Express 932.3527 correct to 3 decimal places.

Answer [1]

- (b) Evaluate $\frac{(-25)^2 + \sqrt{4.03}}{0.898 - 30.2}$, giving your answer correct to 1 significant figure.

Answer [1]

- 2 (a) Express the ratio $3\frac{1}{5} : 24\%$ in its simplest form.

Answer : [2]

- (b) Express 860 g as a percentage 5.6 kg.

Answer % [2]

3 The first four terms of a sequence are 1, 4, 9 and 16.

(a) Write down the 6th term of this sequence.

Answer [1]

(b) Find an expression, in terms of n , for the n th term, T_n , of the sequence.

Answer $T_n =$ [1]

(c) Is the number 99 part of the sequence above? Explain your answer.

Answer because
 [1]

4 If $p : q = 5 : 4$ and $q : r = 4.2 : 0.65$, find $p : r$.

Answer : [3]

- 5 Andy and James are playing a game.
They both start with the same number x .

Andy adds 3 to the number and then triples it.
James multiplies the number by 4 and then subtract 2.
James' result is 4 less than Andy's result.

Write down an equation in x and solve it to find the original number.

Answer $x =$ [3]

- 6 (a) Express 300 as a product of its prime factors. Give your answer in index notation.

Answer 300 = [2]

- (b) Written as a product of its prime factors,

$$2750 = 2 \times 5^3 \times 11.$$

Find the lowest common multiple of 300 and 2750.

Answer L.C.M.= [1]

- (c) Find the smallest possible integer k such that $\frac{2750}{k}$ is a perfect cube.

Answer k = [1]

- 7 A triathlete swims 750 m at an average speed of 1.5 m/s, cycles 20 km at an average speed of 30 km/h and runs 5 km in 25 minutes.

(a) Find the time the triathlete takes to swim 750 m. Give your answer in minutes and seconds.

Answer min sec [2]

(b) Find the average speed, in km/h, of the triathlete for the total distance of the race. Give your answer correct to 1 decimal place.

Answer km/h [3]

8 (a) Factorise $4p - 24pq - 16pr$ completely.

Answer [1]

(b) Simplify the expression $\frac{2(2m + n)}{3} + \frac{(3m - 5n)}{5}$.

Answer [3]

9 Given $a = -2$, $b = 2$ and $c = -3$, evaluate $ab + \frac{2c^2}{a}$.

Answer [2]

10 Sufen paid \$26.70 for a pair of shoes after a discount of 25% from a departmental store. What is the original price of the shoes?

Answer \$ [2]

11 Store ABC sells a laptop at \$3600 inclusive of 7% Goods and Services Tax (GST).

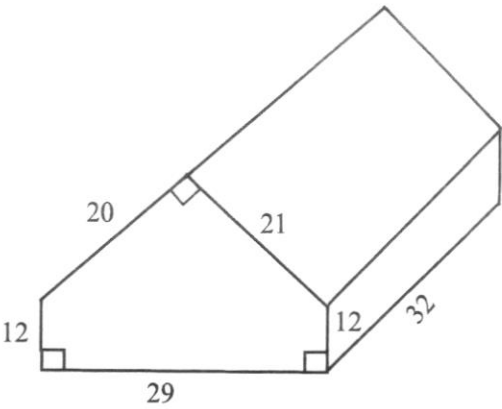
(a) Find the price of the laptop before GST, correct to the nearest dollar.

Answer \$ [2]

(b) James decides to buy the laptop on hire purchase with these terms: a down payment of 25% and the remaining amount to be paid in monthly instalments over 2 years at a simple interest rate of 3.5% per annum. Find his monthly instalment, correct to the nearest cent.

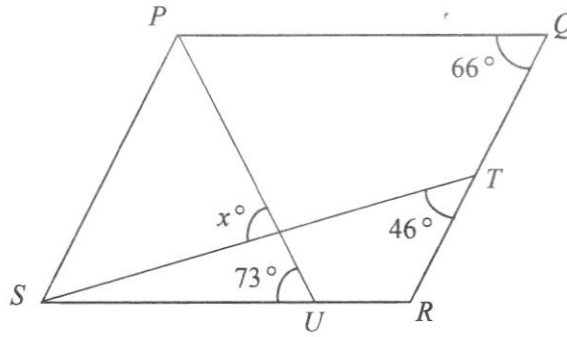
Answer \$ [3]

- 12 The figure shows a prism with measurements given in cm. Find the total surface area of the prism.



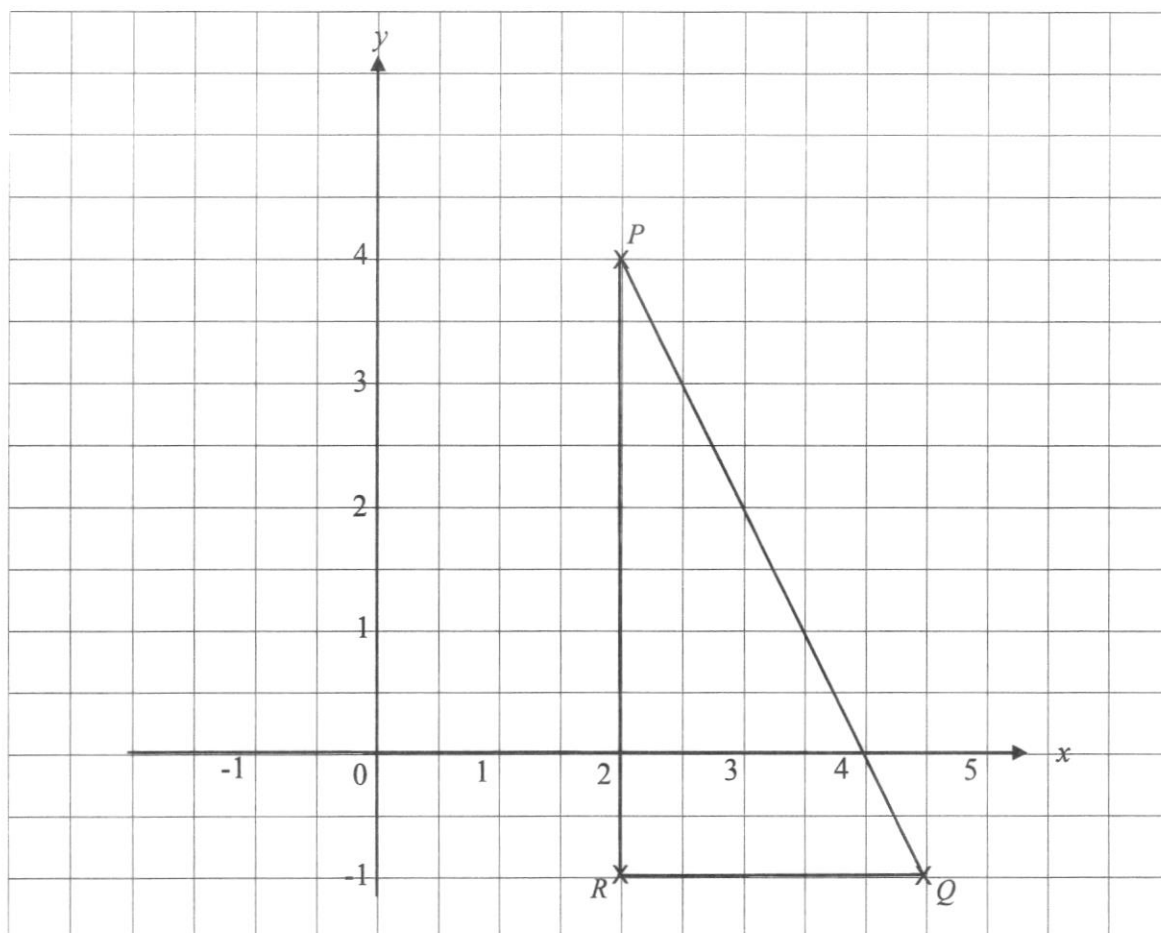
Answer cm² [3]

- 13 $PQRS$ is a parallelogram. ST and PU are straight lines. Angle $PQR = 66^\circ$, angle $STR = 46^\circ$ and angle $PUS = 73^\circ$. Find x .



Answer $x =$ [3]

- 14 The graph below shows 3 points P , Q and R .



- (a) Write down the coordinates of point R .

Answer $R = (\dots\dots\dots , \dots\dots\dots)$ [1]

- (b) State the equation of the line PR .

Answer $\dots\dots\dots$ [1]

- (c) Find the gradient of line PQ .

Answer $\dots\dots\dots$ [1]

- 15 Quadrilateral $PQRS$ is such that $PQ = 6$ cm, $QR = 7.5$ cm, $PS = 6$ cm, angle $QPS = 130^\circ$ and angle $PQR = 90^\circ$. PQ has already been drawn for you.

(a) Construct quadrilateral $PQRS$. [3]

P ————— Q

- (b) Measure and write down angle QRS .

Answer Angle QRS = [1]

END OF PAPER

Candidate Name	Form Class	Index Number
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**ANG MO KIO SECONDARY SCHOOL
END-OF-YEAR EXAMINATION 2022
SECONDARY ONE EXPRESS**

MATHEMATICS
Paper 2

4052/02
12 October 2022
1 hour 15 minutes

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your class, index number and name on all the work you hand in.

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.

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 50.

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 answers in degrees to one decimal place.

For π , use either your calculator value or 3.142.

For Examiner's Use
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This document consists of **17** printed pages and **1** blank page.

Answer **all** the questions.

- 1 (a) Expand and simplify $6x + 2y - 2(3x - 7y)$.

Answer [2]

- (b) (i) Solve $5(1 - 3x) = -9 - x$,

Answer $x =$ [2]

(b) (ii) Solve the equation $\frac{x}{6} - \frac{x-5}{4} = \frac{x-3}{12}$.

Answer $x =$ [3]

- 2 (a) 84 boys and 100 girls signed up for a learning journey. The teacher wanted to divide them into mixed groups with the same number of boys and number of girls in each group.
- (i) Find the largest possible number of groups in this learning journey.

Answer groups [2]

- (ii) Hence, find the number of boys in each group.

Answer boys [1]

- (b) For a television show, $\frac{1}{5}$ of the viewers were under 50 years old, $\frac{1}{4}$ of the viewers were over 75 years old and $\frac{3}{4}$ of those over 75 years old were men. If the total number of viewers was 80, find

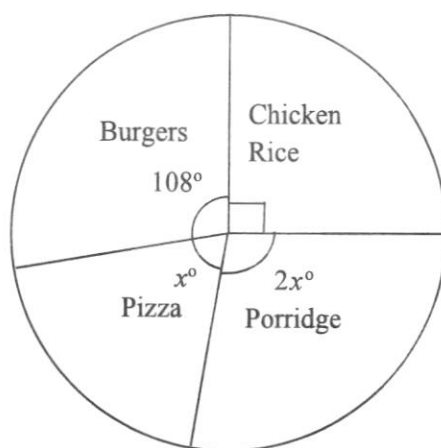
- (i) the number of viewers who were between 50 and 75 years old inclusive,

Answer [2]

- (ii) the number of women over 75 years old.

Answer [1]

- 3 A survey was conducted on a class of 40 students to find out their favourite food. The results are represented on the given pie chart.



- (a) Find the number of students whose favourite food is burgers.

Answer [2]

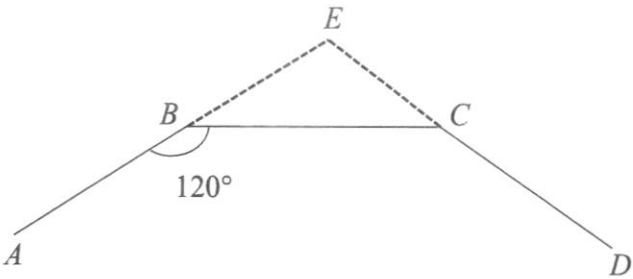
- (b) Find the value of x .

Answer $x =$ [2]

- (c) Given that 5 new students joined the class and they chose chicken rice as their favourite food. Calculate the new angle on the pie chart representing the number of students who chose chicken rice.

Answer[°] [2]

- 4 In the figure below, AB , BC and CD are three sides of a regular polygon and angle $ABC = 120^\circ$. AB and DC are produced to meet at E .



Find

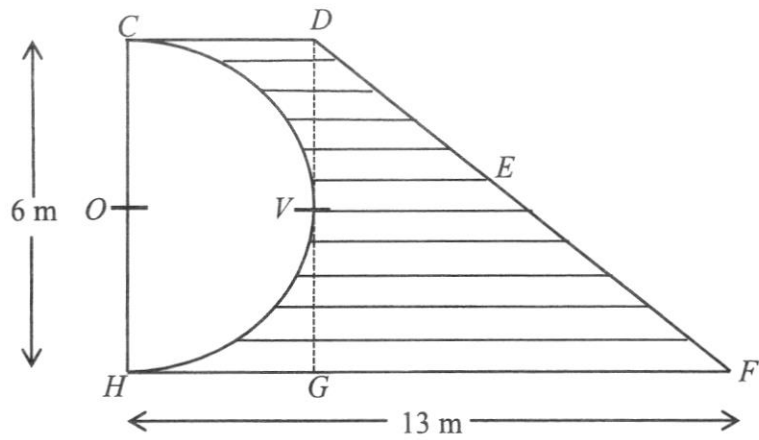
- (a) the number of sides of the polygon,

Answer [2]

- (b) angle CEB .

Answer Angle $CEB =$ [2]

- 5 The diagram below shows the layout of a garden that is made up of a trapezium $CDFH$ with a semicircle CVH with centre O cut out of it. It is given that $CH = 6\text{ m}$ and $HF = 13\text{ m}$. Find the area of the shaded region.
Take $\pi = 3.142$.



Answer m² [3]

6

Answer the whole of this question on the grid provided on the next page.

The following table shows the corresponding x and y values for the equation $y = 4x - 5$.

x	-3	-2	1	2.5	3
y	-17	p	1	5	7

- (a) Find the value of p .

Answer $p =$ [1]

- (b) On the grid provided on page 11, draw the graph of $y = 4x - 5$.

Using a scale of 2 cm to represent 1 unit, draw a horizontal axis for $-3 \leq x \leq 3$.

Using a scale of 2 cm to represent 5 units, draw a vertical axis for $-20 \leq y \leq 10$.

[3]

- (c) From your graph,

- (i) find the value of x when $y = 7$,

Answer $x =$ [1]

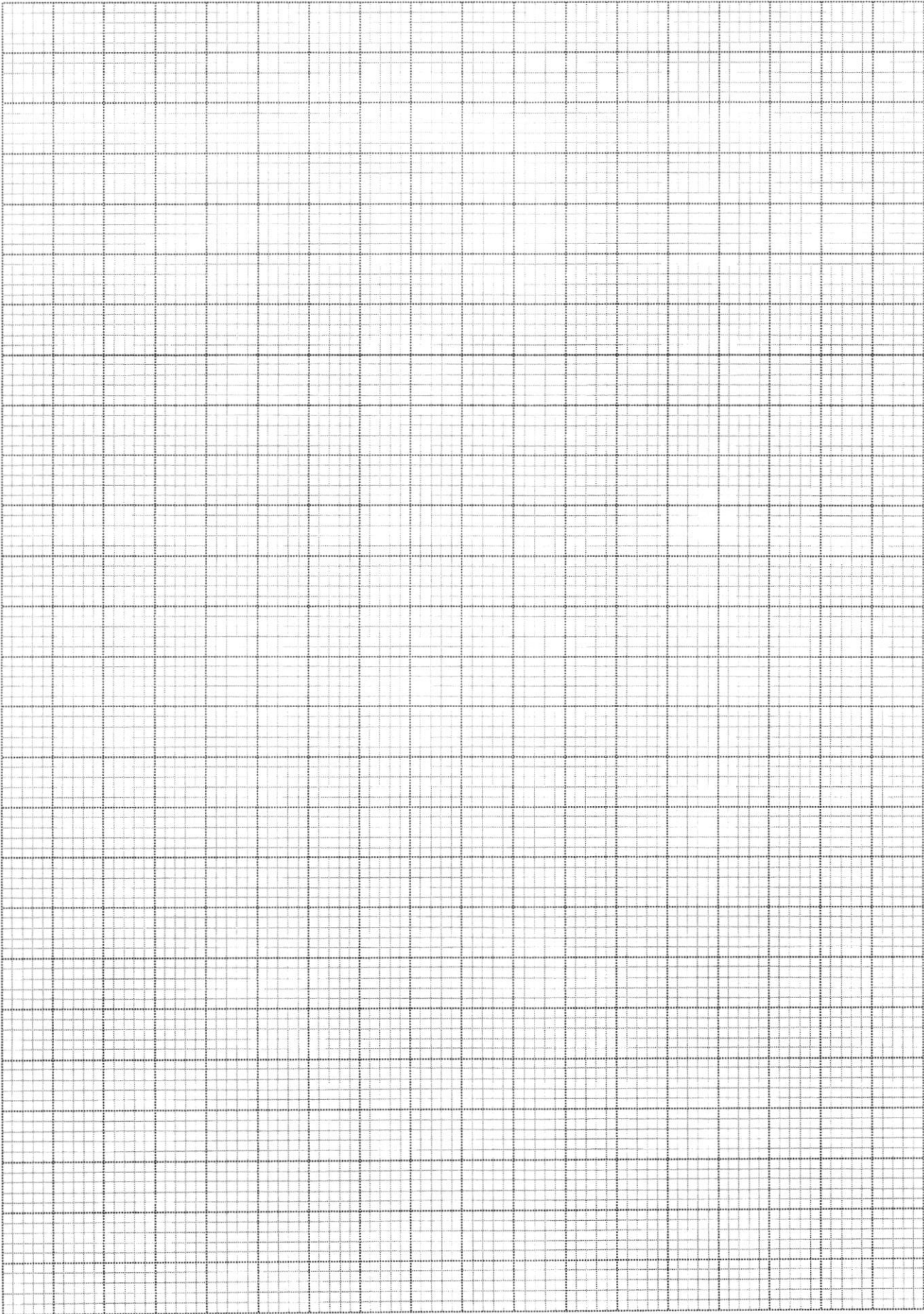
- (ii) state the value of the x -intercept.

Answer [1]

- (d) Draw the line $x = 3$ on the grid provided. [1]

- (e) Write down the equation of the line which has the same gradient as the line $y = 4x - 5$ and y -intercept 1.

Answer [1]



- 7 (a) Mavis travels from Singapore to Thailand. She exchanges 750 Singapore Dollars (S\$) to Thai Baht (THB) when the exchange rate is S\$1 = 26 THB. While in Thailand, she spends 14 200 THB. On her return, she exchanges the remaining Thai Baht into Singapore Dollars when the exchange rate is S\$1 = 26.5 THB.

(i) How much does she receive in Thai Baht?

Answer THB [1]

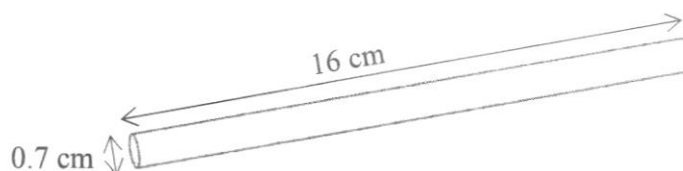
(ii) Find the amount of Singapore Dollars she receives.

Answer S\$ [2]

- (b) Every year, the value of a car depreciates by 15% of its value in the previous year. If the value of the car was \$93 925 in 2022, find its value in 2020.

Answer S\$ [3]

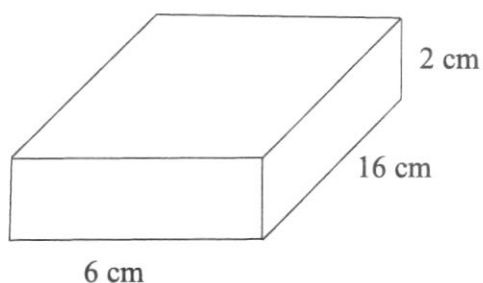
- 8 The diagram below shows an unsharpened pencil. It is cylindrical in shape. The diameter and length of the pencil are 0.7 cm and 16 cm respectively.



- (a) Calculate the volume of the pencil, leaving your answer in terms of π .

Answer cm^3 [2]

- (b) A number of this pencil can fit exactly into a pencil case with dimensions as given in the diagram below.



- (i) Find the maximum number of pencils that can fit into the pencil case.

Answer [1]

(ii) Hence, find the percentage of empty space in the box.

Answer % [2]

9 The table below shows the parking charges at Changi Airport Terminal 1.

Terminal 1 /Jewel Car Park Charges
<u>Short-term Parking (B2M and B2)</u>
First 90 mins: \$0.04 per minute
Subsequent 30 mins or part thereof: \$5 per 30 mins
<u>General Parking (B3 and B5)</u>
\$0.04 per minute

- (a) Joseph parked his car at B2M level at 6:30 pm and paid \$8.60 for parking charges upon leaving the car park. What is the latest possible time that he left the car park? Explain your answer with working.

Answer [2]

- (b) Pearlyn is considering whether to park her car at B2 or B3 at Changi Airport Terminal 1. She intends to stay at the airport for 2.5 hours. Which is a cheaper option? Explain your answer with working.

Answer She should park at because

.....

..... [3]

END OF PAPER

AMKSS 1E EM P1 FE 2022 Answer Scheme

Qn	Answers	Marking Scheme
1(a)	932.353	B1
(b)	$\frac{(-25)^2 + \sqrt{4.03}}{0.898 - 30.2} = -21.39811228 = -20$ (1 s.f.)	B1
2(a)	$3\frac{1}{5} : \frac{24}{100}$ $\frac{16}{5} : \frac{24}{100}$ $\frac{16}{5} \times 100 : \frac{24}{100} \times 100$ $320 : 24$ $40 : 3$ Or $3.2 : 0.24$ $320 : 24$ $40 : 3$	M1 A1
2(b)	$\frac{860}{5600} \times 100\%$ $= 15\frac{5}{14}\%$ or 15.4% (to 3 s.f.)	M1 A1
3(a)	36	B1
3(b)	n^2	B1
3(c)	No, it is not a perfect square.	B1
4	$q : r = 4.2 : 0.65$ $= 420 : 65$ $p : q = 5 : 4$ $q : r = 420 : 65$ $p : q = 525 : 420$ $q : r = 420 : 65$ $p : r = 525 : 65$ $= 105 : 13$	 } M1, M1 A1

5	Andy: $3(x+3)$ James: $4x-2$ $(4x-2)+4=3(x+3)$ $4x+2=3x+9$ $x=9-2$ $x=7$	M1 M1 A1												
6(a)	<table><tr><td>2</td><td>300</td></tr><tr><td>2</td><td>150</td></tr><tr><td>3</td><td>75</td></tr><tr><td>5</td><td>25</td></tr><tr><td>5</td><td>5</td></tr><tr><td></td><td>1</td></tr></table> $300 = 2^2 \times 3 \times 5^2$	2	300	2	150	3	75	5	25	5	5		1	M1 A1
2	300													
2	150													
3	75													
5	25													
5	5													
	1													
6(b)	LCM = $2^2 \times 3 \times 5^3 \times 11 = 16500$	B1												
6(c)	$k = 2 \times 11 = 22$	B1												
7(a)	Time taken = $\frac{750}{1.5}$ = 500 s = 8 min 20 sec	M1 A1												
7(b)	Total distance = $0.75 + 20 + 5$ = 25.75 km Total time taken = $(500 \div 3600) + (20 \div 30) + (25 \div 60)$ = $\frac{44}{36}$ h Average speed = $25.75 \div \frac{44}{36} = 21.06818182 = 21.1 \text{ km/h (to 1 d.p.)}$	M1 M1 A1												

8(a)	$4p - 24pq - 16pr = 4p(1 - 6q - 4r)$	B1
8(b)	$\frac{2(2m+n)}{3} + \frac{(3m-5n)}{5} = \frac{10(2m+n) + 3(3m-5n)}{15}$ $= \frac{20m+10n+9m-15n}{15}$ $= \frac{29m-5n}{15}$	M1 M1 A1
9	$ab + \frac{2c^2}{a}$ $= (-2)(2) + \frac{2(-3)^2}{-2}$ $= -4 + (-9)$ $= -13$	M1 A1
10	Original price of shoes = $\frac{100}{75} \times \$26.70 = \35.60	M1, A1
11(a)	107% - 3600 1% - 3600/107 100% - 100 x 3600/107 = 3364 (nearest dollar)	M1 A1
11(b)	25% x \$3600 = \$900 \$3600 - \$900 = \$2700 $I = \frac{PRT}{100} = \frac{2700 \times 3.5 \times 2}{100} = 189$ Total amount payable = \$2700 + \$189 = \$2889 Monthly Instalment = $\frac{2700+189}{24}$ = \$120.38(nearest cent)	M1 M1 A1
12	Base Area = Area of triangle + Area of rectangle $= \left(\frac{1}{2} \times 20 \times 21 \right) + (29 \times 12)$ = 210 + 348 = 558 cm ² Total Surface Area = 2(558) + (21+20+12+29+12) × 32 = 1116 + 3008 = 4124 cm ²	M1, M1 A1

13	$\angle SRQ = 180^\circ - 66^\circ$ (int. $\angle$ of //gram) $= 114^\circ$ $\angle RST = 180^\circ - 114^\circ - 46^\circ$ ($\angle$ sum of Δ) $= 20^\circ$ $x = 180^\circ - [180^\circ - 20^\circ - 73^\circ]$ ($\angle$ s on straight line) $= 180^\circ - 87^\circ = 93^\circ$	M1 M1, A1
14(a)	$\{2, -1\}$	B1
14(b)	$x = 2$	B1
14(c)	$\frac{-5}{2.5} = -2$	B1
15(a)	Refer to diagram 1 mark for all points joined correctly 1 mark for each vertex (point R & S) drawn correctly. 2 mk	M1, M1 A1
15(b)	$\angle QRS = 73^\circ$ Accept ± 1 deg	B1