REGENT SECONDARY SCHOOL
END-OF-YEAR EXAMINATION 2022
SECONDARY ONE EXPRESS

NAME: _____ INDEX NUMBER: _____

CLASS: _____ SETTER : Ms Elaine Leong

MATHEMATICS 4052/01

Paper 1 **10 October 2022**

1 hour 15 min

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your class, index number and name in the spaces 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, highlighters, glue or correction fluid.

Answer **all** questions.
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 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, unless the question requires the answer in terms of π.

The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 50.

	TARGET
50	
PARENT'S SIGNATURE	

This document consists of 11 printed pages.

Answer **all** the questions.

1 Consider the numbers below.

$$3,\ \sqrt{16},\ \frac{125}{5},\ 7,\ 3\pi$$

(a) Write down the prime number(s).

Answer ..... [1]

(b) Write down the irrational number(s).

Answer ..... [1]

(c) Write down the square number(s).

Answer ..... [1]

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2 **(a)** Calculate $\frac{-5\times\sqrt[3]{12.3}}{1.4-(-2)}$, showing first five figures on your calculator display.

Answer ..... [1]

(b) Give your answer correct to 2 significant figures.

Answer ..... [1]

---

3 **(a)** Express 600 as the product of its prime factors in index notation.

Answer ..... [2]

(b) Written as the product of its prime factors,

$$P = x^6 \times y^6.$$

Based on the given information, it is concluded that the number P is both a perfect square and a perfect cube. Do you agree? Explain your answer.

Answer

.....

..... [1]

4 A sum of money is shared between Gary, Winnie and Fandi in the ratio of 5 : 3 : 1.

Winnie decided to give 50% of what she has to Fandi. As result, Fandi has $500.

Calculate the sum of money that was shared.

Answer $..... [3]

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5 Express

(a) 56% as a fraction,

Answer ..... [1]

(b) 40km/h in m/s.

Answer ..... m/s [2]

6 Expand and simplify the following algebraic expressions.

(a) $-2m+7-2m-3$

Answer ..... [1]

(b) $4(y+2)-5(2y-3)$

Answer ..... [2]

(c) $\frac{x-3}{3}+\frac{-5+2x}{5}$

Answer ..... [3]

7 A sequence of made up of squares is shown below.

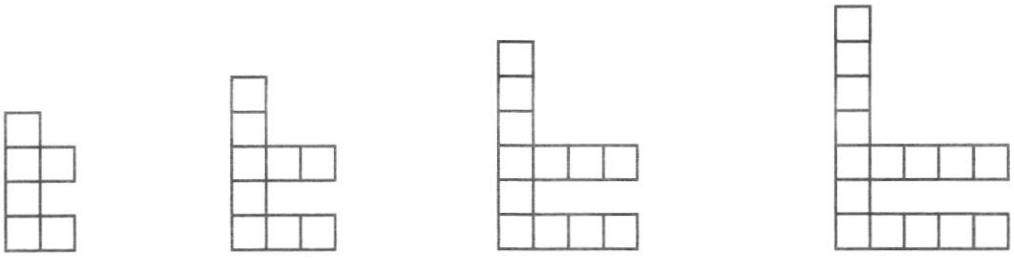


Diagram 1 Diagram 2 Diagram 3 Diagram 4

Diagram Number	1	2	3	4	5
Number of squares	6	9	12	15	r

(a) Find the value of r.

Answer ..... [1]

(b) Write down an expression for the nth term of the sequence.

Answer ..... [1]

(c) Find the number of squares in diagram 40.

Answer ..... [1]

(d) Find the diagram number that has 51 squares.

Answer ..... [1]

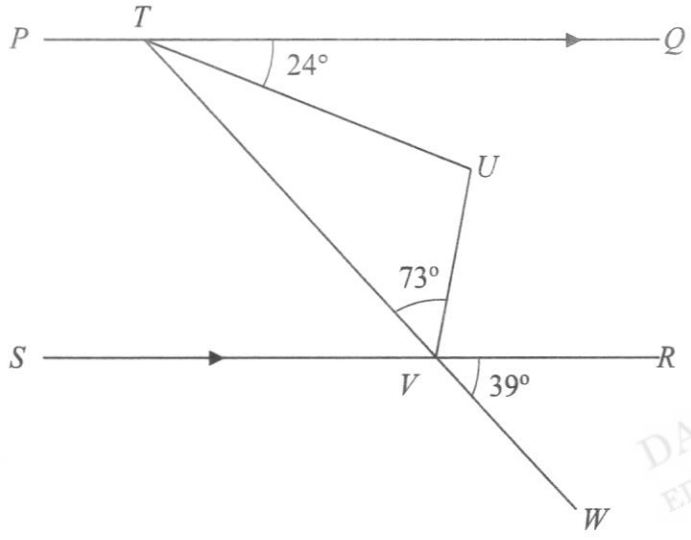
(e) Ethan said that all multiples of 3 is a term in the sequence. Do you agree with the statement? Explain your answer.

Answer

.....

..... [1]

8 In the diagram, PTQ, TVW and SVR are straight lines and PQ is parallel to SR.
$\angle QTU = 24°$, $\angle RVW = 39°$ and $\angle TUV = 73°$.



Stating your reasons clearly in your working, find

(a) $\angle TVS$,

Answer .....° [1]

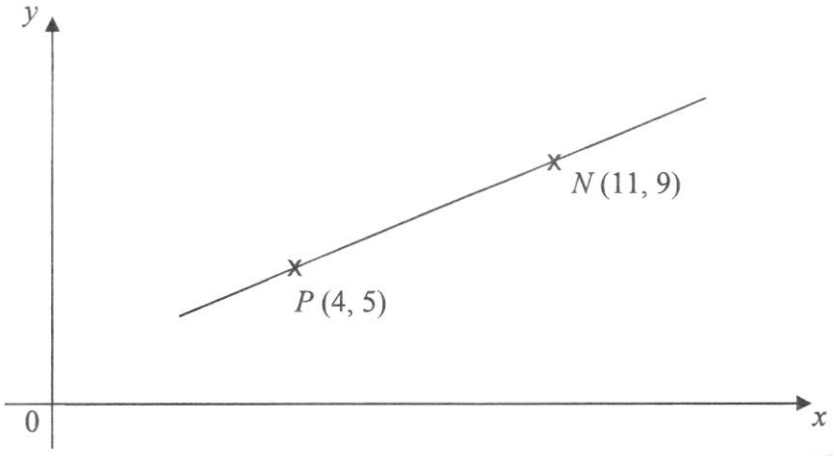
(b) $\angle UTV$,

Answer .....° [2]

(c) reflex $\angle TUV$,

Answer .....° [2]

9 The graph below shows a line with points P and N.



(a) Find the gradient of line.

Answer ..... [1]

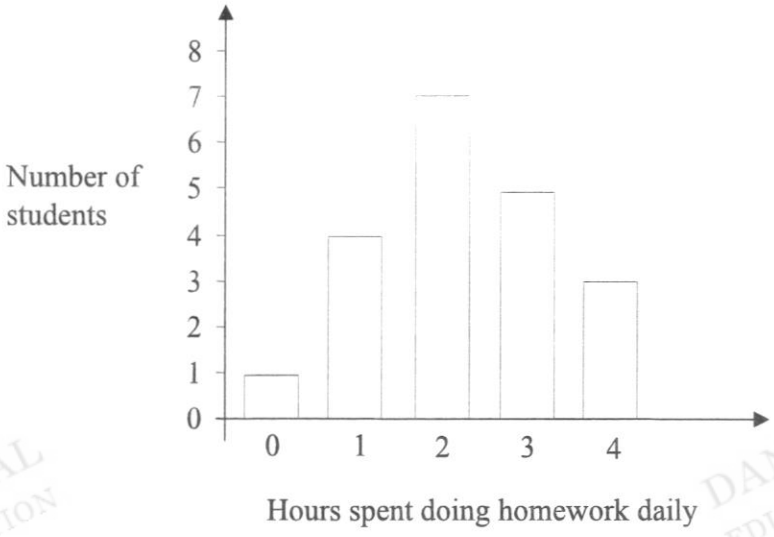
(b) Given that the equation of the line is $7y = 4x + 19$, show that the y-intercept of the line is $\frac{19}{7}$. [1]

Answer

(c) Does $(2, 4)$ lie on the line $7y = 4x + 19$? Show you workings clearly. [1]

Answer

10 The bar graph shows the hours spent doing homework by different students in a class.



(a) Find the total number of students in the class.

Answer ..... [1]

(b) Express the number of students who spend 3 hours doing work daily as a percentage of the whole class.

Answer ..... % [1]

(c) Calculate the average number of hours the students spend doing homework daily.

Answer ..... [2]

11 Mrs Ravi deposited an amount $\$P$ in PBS bank at the start of February 2021.

The bank pays a **monthly** simple interest rate of 0.03% at the end of every month.

Mrs Ravi checked her account at the start of May 2022 and found that the total amount in the account is \$56 252.

(a) Find the amount of interest earned in terms of P.

Answer \$..... [1]

(b) Calculate the initial amount that Mrs Ravi deposited.

Answer \$..... [3]

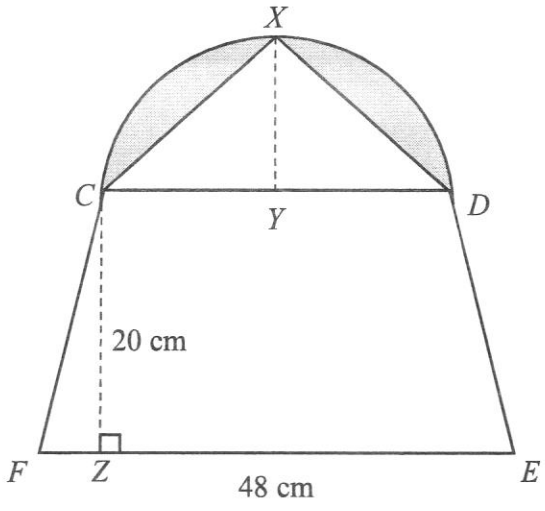
12 **(a)** Construct a parallelogram $PQRS$ such that $PS = 7$ cm and angle $PQR = 70^{\circ}$.
The line PQ has been provided. [2]

(b) Draw the diagonals of the parallelogram and mark the intersection point of the diagonal with the letter T. [1]

(c) Measure and write the angle STR.

Answer .....° [1]

13 In the figure, CXD is a semicircle with the centre Y and $CDEF$ is a trapezium. $CZ = 20$ cm and $FE = 48$ cm.



(a) If the area of trapezium $CDEF$ is 820 cm^2, find the length of CD.

Answer ..... cm [2]

(b) Hence, find the area of the shaded region.

Answer ..... cm^2 [3]

End of Paper

REGENT SECONDARY SCHOOL
END-OF-YEAR EXAMINATION 2022
SECONDARY ONE EXPRESS

NAME: _____ INDEX NUMBER: _____

CLASS: _____ SETTER : Ms Elaine Leong

MATHEMATICS **4052/02**

Paper 2 **12 October 2022**

1 hour 30 min

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your class, index number and name in the spaces at the top of this page.
Write in dark blue or black pen.
You may use an HB pencil for any diagrams or graphs.
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The number of marks is given in brackets [ ] at the end of each question or part question.
The total of the marks for this paper is 50.

	TARGET
50	
PARENT'S SIGNATURE	

This document consists of 13 printed pages.

Answer **all** the questions.

1 Factorise the following algebraic expressions.

(a) $18bh + 3by$

Answer ..... [1]

(b) $\frac{3}{5}x^2y + \frac{1}{5}xy^2$

Answer ..... [1]

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2 Tim, Nora and Danson are given 3 ribbons of equal lengths.

Tim cuts his ribbon into smaller pieces of equal length of 42 cm.

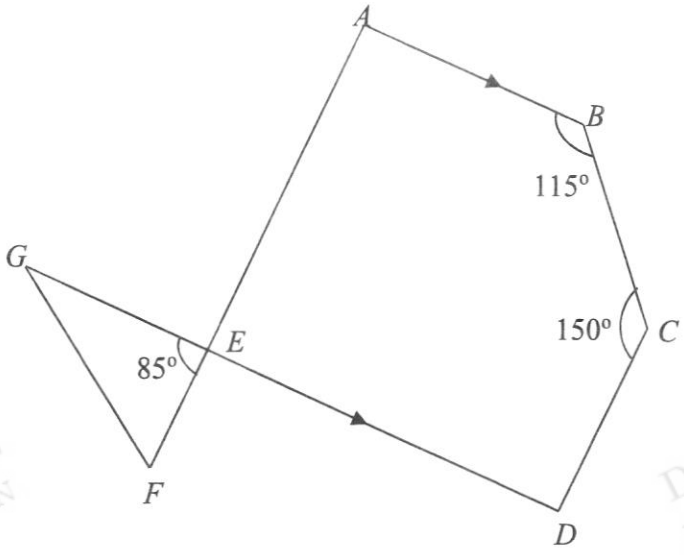
Nora cuts her ribbon into smaller pieces of equal length of 24 cm.

Danson cuts his ribbon into smaller pieces of equal length of 60 cm.

If there are no ribbon leftover, what is the shortest possible length of ribbon given to each of them?

Answer ..... [3]

3 In the diagram below, $ABCDEGF$ is made up of a pentagon and a triangle.
AB is parallel to ED, angle $ABC = 115°$, angle $BCD = 150°$ and angle $GEF = 85°$.



(a) Find

(i) sum of interior angles in the pentagon $ABCDE$,

Answer .....° [1]

(ii) angle EAB,

Answer .....° [2]

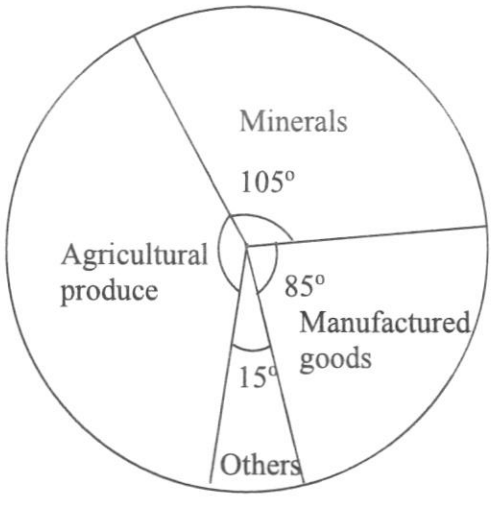
(iii) angle EDC.

Answer .....° [1]

(b) Using your answer in part (c), what can be said about lines EA and DC? Explain your answer.

Answer ..... [1]

4 The pie chart shows the exports of a country in 2021.



(a) Express the export of minerals as a ratio of the agricultural produce.

Answer ..... : ..... [2]

(b) If the value of the export of manufactured goods is worth $18 million dollars in 2021, find the total value of all exports in the country in 2021.

Answer $ ..... million [2]

5 Caleb and Jean started their journey to Kuala Lumpur from Singapore at 0900. The distance between Singapore and Kuala Lumpur is 330 km. They drove 190 km for 2 hours and decided to stop for a meal for 40 minutes.

(a) Find the speed the journey for the first 2 hours.

Answer ..... km/h [1]

(b) After the meal, Caleb and Jean continued driving and reached Kuala Lumpur at 1325. Calculate the average speed for the whole journey.

Answer ..... km/h [2]

(c) Jean said that if they drove at the same speed as the first part of the journey, they will reach Kuala Lumpur before 1300. Do you agree with Jean? Support your answer with workings.

Answer.....

..... [3]

(d) For each litre of petrol, the car is able to travel a distance of 10.5 km.
Calculate the amount of petrol, corrected to the nearest whole number, needed for the whole journey from Singapore to Kuala Lumpur.

Answer ..... litres [2]

(e) At Kuala Lumpur, Caleb decided to pump petrol for the journey back to Singapore.
Given that each litre of petrol cost RM 2.80 and 1 SGD = RM 3.17, calculate how much will it cost in Singapore dollars for the return journey.

Answer S$ ..... [3]

6 The number of participants for an event in 2020 is Y. In 2021, the number of participants is increased by 30%.

(a) Write down an expression in terms of Y, for the number of participants in 2021.

Answer ..... [1]

(b) In 2022, the number of participants is increased by 350 from 2021.
Write down an expression in terms of Y, for the number of participants in 2022.

Answer ..... [1]

(c) If the total number of participants is 1390 in 2022, form an equation in terms of Y and find the number of participants for the event in 2020.

Answer ..... [3]

7 The table below shows the carpark rates in Mandarin Orchard, Singapore.

Weekdays (Monday to Friday)	Weekends (Saturday and Sunday)
6am to 6pm $3.60 for first hour $0.06 per minute after the first hour.	Same as weekdays
6pm to 6am $3.60 for first hour $0.04 per minute after the first hour.	**6pm to 6am** $3.60 per entry

(a) Mrs Tan wants to park her car at Mandarin Orchard on a Sunday from 4.30pm to 6.30pm.

Find the total carpark charges for the duration she parked.

Answer $ ..... [2]

(b) Heidi has $6 in her cashcard that is used to pay for the carpark charges in Mandarin Orchard on a Wednesday.

She said that with the same amount of money in her cashcard, she can park 20 minutes longer if she enters the carpark after 6pm compared to before 6pm.

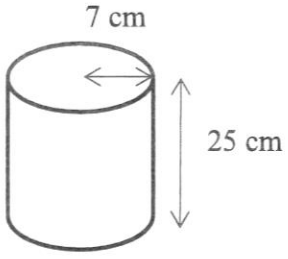
Do you agree? Support your answers with working.

Answer.....

..... [3]

8 The diagram below shows a cylindrical container used to store sand.

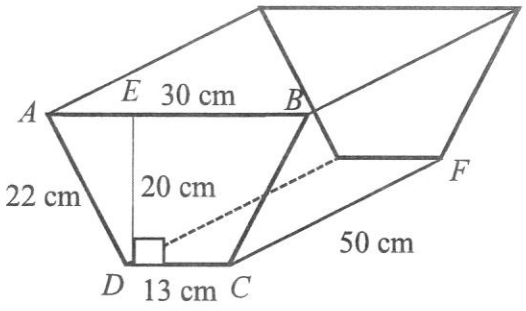
The cylinder has a radius of 7 cm and a height of 25 cm.



(a) Calculate the volume of the cylinder.

Answer ..... cm^3 [2]

(b) The diagram below shows an **open** prism whose cross-section is a trapezium $ABCD$.
$AB = 30$ cm, $DC = 13$ cm, $DE = 20$ cm, $AD = BC = 22$ cm and $CF = 50$ cm.
Calculate the volume of the prism.



Answer ..... cm^3 [3]

(c) Kris decided to fill the trapezoidal prism with sand.

Calculate the number of cylindrical containers of sand that is needed.

Answer ..... [2]

(d) Kris decided to paint the outer surfaces of the trapezoidal prism.

Calculate the total surface area that she needs to paint.

Answer ..... cm^2 [3]

9 The table below shows the values of x and y connected by the equation, $y = -5x + 4$.

x	0	2	4	5	7
y	4	−6	p	−21	−31

(a) Calculate the value of p

Answer ..... [1]

(b) On the grid next page, draw the graph of $y = -5x + 4$ for $0 \le x \le 7$. [2]

(c) From your graph, find

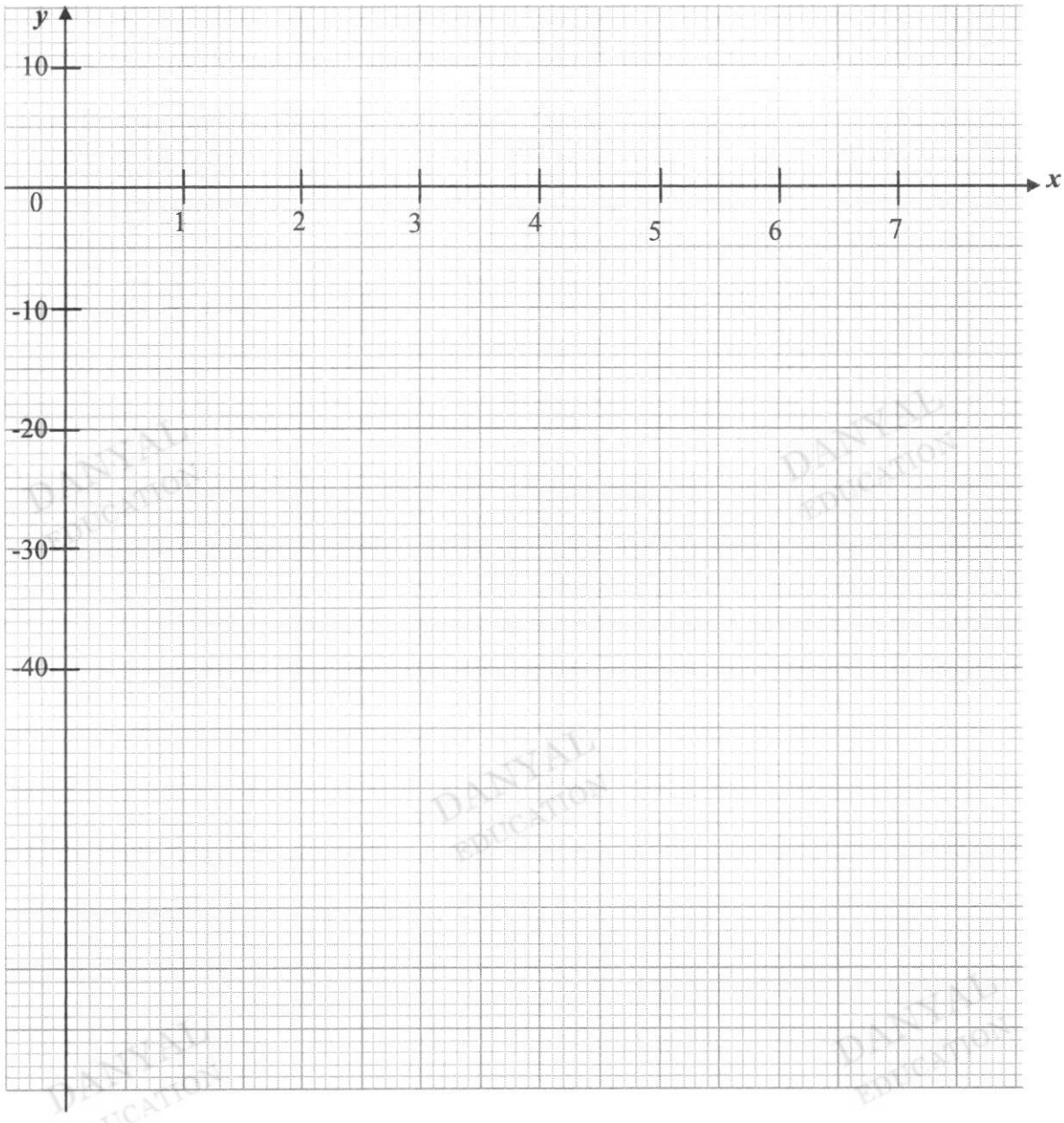
(i) the value of y when $x = 1$

Answer ..... [1]

(ii) the value of x when $y = -26$

Answer ..... [1]

9b)

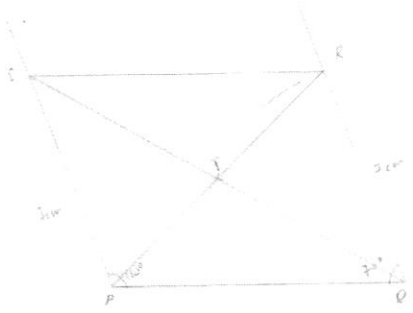


End of Paper

Regent Secondary School
Elementary Mathematics
Sec 1EXP EOY 2022 Paper 1 (Setter: Elaine Leong)
Marking Scheme

Qn		Solutions	Marks	Total	Remarks/Markers' Report
1	(a)	3, 7	B1	1	
	(b)	3π	B1	1	
	(c)	$\sqrt{16}$, $\frac{125}{5}$	B1	1	
2	(a)	-3.3946	B1	1	
	(b)	-3.4	B1	1	
3	(a)	$600 = 2^3 \times 3 \times 5^2$	M1 A1	2	
	(b)	Yes as the power 6 is a multiple of 2 and 3.	B1	1	
4		$\frac{50}{100} \times 3 = 1.5$ $2.5u \text{ --- } \$500$ $1u \text{ --- } \$200$ $9u \text{ --- } \$200 \times 9 = \$1800$	M1 M1 A1	3	
5	(a)	$\frac{56}{100} = \frac{14}{25}$	B1	1	
	(b)	$1h \text{ --- } 40km$ $3600s \text{ --- } 40000m$ $1s \text{ --- } 11\frac{1}{9} m/s$	M1 A1	2	
6	(a)	$-2m+7-2m-3$ $= -4m+4$	B1	1	
	(b)	$4(y+2)-5(2y-3)$ $= 4y+8-10y+15$ $= -6y+23$	M1 A1	2	
	(c)	$\frac{x-3}{3} + \frac{-5+2x}{5}$ $= \frac{5(x-3)+3(-5+2x)}{15}$ $= \frac{5x-15-15+6x}{15}$ $= \frac{11x-30}{15}$	M1 M1 A1	3	
7	(a)	$r = 18$	B1	1	
	(b)	$3n+3$	B1	1	
	(c)	$3(40)+3 = 123$	B1	1	
	(d)	$3n+3 = 51$ $3n = 48$ $n = 16$	B1	1	
	(e)	No as 3 is not a term in the sequence.	B1	1	

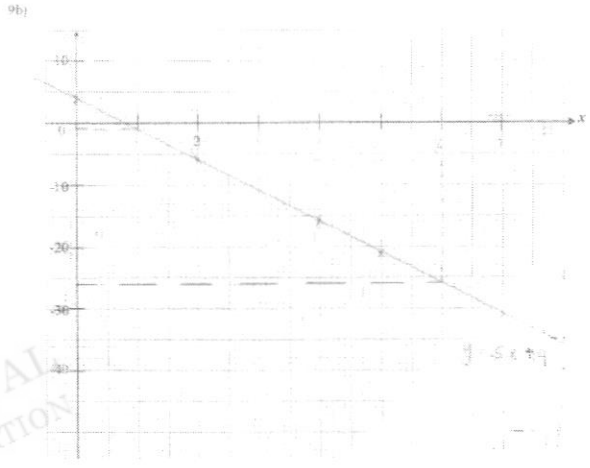
8	**(a)**	$\angle TVS = 39°$ (Vert. opp. angles)	**B1**	**1**	
	(b)	$\angle QTV = \angle TVS$ (Alt. angle) $\angle UTV = 39 - 24$ $\angle UTV = 15°$	**M1** **A1**	**2**	
	(c)	$\angle TUV = 180 - 73 - 15$ (Sum of angles in tri.) $\angle TUV = 92°$ $reflex\angle TUV = 360 - 92$ (angles at a pt) $reflex\angle TUV = 268°$	**M1** **A1**	**2**	
9	**(a)**	$m = \dfrac{9-5}{11-4}$ $m = \dfrac{4}{7}$	**B1**	**1**	
	(b)	$7y = 4x + 19$ $y = \dfrac{4}{7}x + \dfrac{19}{7}$ As $y = mx + c$, y-intercept is $\dfrac{19}{7}$	**B1**	**1**	
	(c)	$7y = 4x + 19$ $7y = 4(2) + 19$ $7y = 27$ $y = \dfrac{27}{7}$ Since $y \neq 4$, (2, 4) does not lie on the line.	**B1**	**1**	
10	**(a)**	Total students $= 1 + 4 + 7 + 5 + 3$ $= 20$	**B1**	**1**	
	(b)	$\dfrac{5}{20} \times 100$ $= 25\%$	**B1**	**2**	
	(c)	$\dfrac{0(1) + 1(4) + 2(7) + 3(5) + 4(3)}{20}$ $= 2.25$	**M1** **A1**	**2**	
11	**(a)**	Interest $= \dfrac{P \times 0.03 \times 15}{100}$ $= \dfrac{9}{2000}P$	**B1**	**1**	
	(b)	$P + \dfrac{9}{2000}P = 56252$ $P + 0.0045P = 56252$ $1.0045P = 56252$ $P = \dfrac{56252}{1.0045}$ $P = \$56000$	**M1** **M1** **A1**	**3**	

12	**(a, b)**	 (a) M1 – Correct length M1 – Correct angle (b) Correct diagonal with label T.			
	(c)	106°	**B1**	**1**	
13	**(a)**	$820 = \frac{1}{2} \times (CD + 48) \times 20$ $820 = 10(CD + 48)$ $82 = CD + 48$ $CD = 34cm$	**M1** **A1**	**2**	
		Radius $= 34 \div 2$ $= 17cm$ $= \frac{1}{2} \times \pi \times 17^2 - \frac{1}{2} \times 34 \times 17$ $= 164.9601$ $= 165cm^2$	**M1** **M1** **A1**	**3**	

Regent Secondary School
Elementary Mathematics
Sec 1EXP EOY 2022 Paper 2 (Setter: Elaine Leong)
Marking Scheme

Qn		Solutions	Marks	Total	Remarks/Markers' Report
1	(a)	$18bh+3by$ $=3b(6h+y)$	B1	1	
	(b)	$\frac{3}{5}x^2y+\frac{1}{5}xy^2$ $=\frac{1}{5}xy(3x+y)$	B1	1	
2		$42=2\times3\times7$ $24=2^3\times3$ $60=2^2\times3\times5$ Shortest possible length $=2^3\times3\times5\times7$ $=840cm$	M1 M1 A1	3	
3	(ai)	Sum of interior angles $=180(5-3)$ $=540°$	B1	1	
	(aii)	$\angle DEA=85°$ $\angle EAB=180-85$ $\angle EAB=95°$	M1 A1	2	
	(aiii)	$\angle EDC=540-115-150-95-85$ $\angle EDC=95°$	B1	1	
	(b)	$\angle EDC=95°$ $\angle EDC+\angle DEA=180°$ Interior angle on a pair of parallel line.	B1	1	
4	(a)	Angle rep agriculture = $360-15-85-105=155$ 105:155 21:31	M1 A1	2	
	(b)	$=\frac{360}{85}\times18$ Total value of export $=76.235million$ $=76.2million$	M1 A1	2	
5	(a)	Speed $=\frac{190}{2}$ $=95km/h$	B1	1	
	(b)	$1140--1325=1h45\min$ $=330\div(2\frac{40}{60}+1\frac{45}{60})$ Average Speed $=74\frac{38}{53}km/h$ Accept 74.7	M1 A1	2	

	(c)	Distance remaining $= 330 - 190$ $= 140km$ Time needed $= \frac{140}{95}$ $= 1h28\min$ 1140 + 1h 28 min = 1308 No, with the speed of of 95 km/h, they will reach only at 1308.	M1 M1 A1	3	
	(d)	$= \frac{330}{10.5}$ Amt of petrol $= 31.428$ $= 32l$	M1 A1	2	
	(e)	Cost of petrol in RM $= 32 \times 2.80$ $= 89.60RM$ $= \frac{89.60}{3.17}$ Amt in Singapore Dollars $= S\$28.2649$ $= S\$28.26$	M1 M1 A1	3	
6	(a)	$1.3Y$	B1	1	
	(b)	$1.3Y + 350$	B1	1	
	(c)	$1.3Y + 350 = 1390$ $1.3Y = 1040$ $Y = 800$	M1 M1 A1	3	
7	(a)	Total charges $= 3.60 + 30(0.06) + 3.60$ $= \$9$	M1 A1	2	
	(b)	Amt of time before 6pm $= 60 + \frac{2.4}{0.06}$ $= 100\min$ Amt of time after 6pm $= 60 + \frac{2.4}{0.04}$ $= 120\min$ Yes, she can park 20 minutes more.	M1 M1 A1	3	
8	(a)	$= \pi \times 7^2 \times 25$ Volume $= 3848.451$ $= 3850cm^3$	M1 A1	2	
	(b)	Base area $= 0.5(13+30)(20)$ $= 430cm^2$ Volume $= 430 \times 50$ $= 21500cm^3$	M1 M1 A1	3	
	(c)	$= 21500 \div 3848.451$ No. of containers $= 5.586$ $= 6$	M1 A1	2	

	(d)	Total surface area $= 2\times\frac{1}{2}\times(13+30)\times 20+2\times 22\times 50+13\times 50$ $= 3710cm^2$	**M2** **A1**	**3**	
9	**(a)**	$p=-16$	**B1**	**1**	
	(b)	 M1 – correct points M1- straight line plotted		**2**	
	(ci)	$y=-1$	**B1**	**1**	
	(cii)	$x=6$	**B1**	**1**	