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KRANJI SECONDARY SCHOOL

Sec 1 (G3)
Session 1

END – OF – YEAR EXAMINATIONS 2022

MATHEMATICS 4052

PAPER 1

Level : Secondary One

Date : 26 Sept 2022

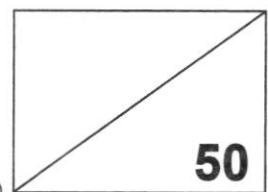
Course : G3

Duration : 1 hour 15 minutes

Name : _____ () **Marks** :

Class : Secondary 1 _____

Grouping - *Alpha / Beta / Kappa / Sigma (*circle accordingly)



READ THESE INSTRUCTIONS FIRST

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

Write in dark blue or black pen.

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

Do not use staples, paper clips, 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 your 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.

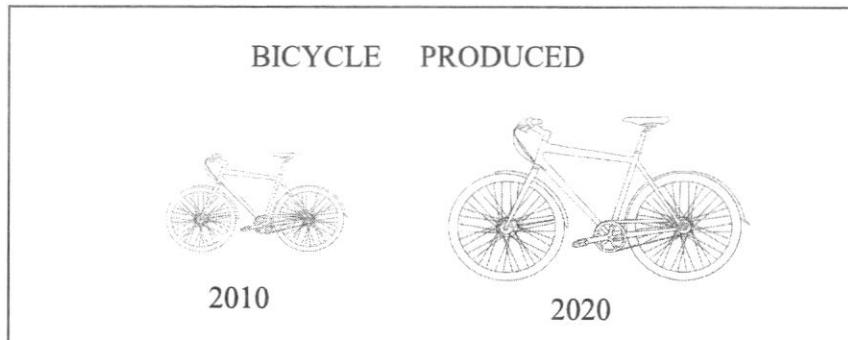
The total of the marks for this paper is 50.

Setter: Mdm J Mah

This paper consists of 14 printed pages, including the cover page.

[Turn over]

- 1 The diagram is taken from an advertisement of a bicycle manufacturer. It claims that the number of bicycles produced had doubled between 2010 and 2020.
Explain briefly why the advertisement might be misleading.



Answer

 [1]

- 2 It is given that $T = \frac{m(n+4)}{6-n}$. Calculate the value of T when $m = 17.348$ and $n = 2.14$.

Write your answer correct to two decimal places.

Answer [2]

- 3 By writing each number correct to 1 significant figure, estimate the value of

$$\frac{\sqrt{49.8} \times 7.9}{3.5}$$

Answer [2]

- 4 The Residents' Committee plans to distribute 126 pencil boxes, 252 pens and 189 books equally, without any leftover, to the needy students in the neighbourhood. Find the largest possible number of students who will receive the gifts.

Answer [2]

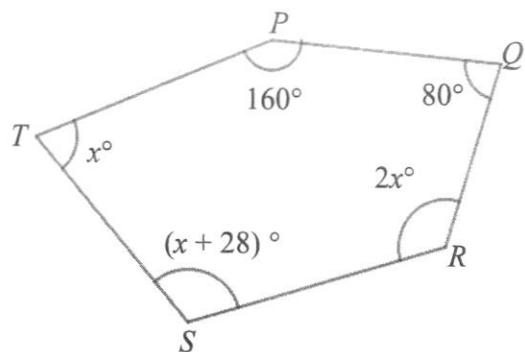
- 5 (a) Express $22\frac{3}{4}\%$ as a fraction in its simplest form.

Answer [1]

- (b) Express 14 g as a percentage of 8 kg.

Answer% [2]

- 6 (a) In the pentagon $PQRST$, angle $QPT = 160^\circ$ and angle $PQR = 80^\circ$. Calculate the value of x .

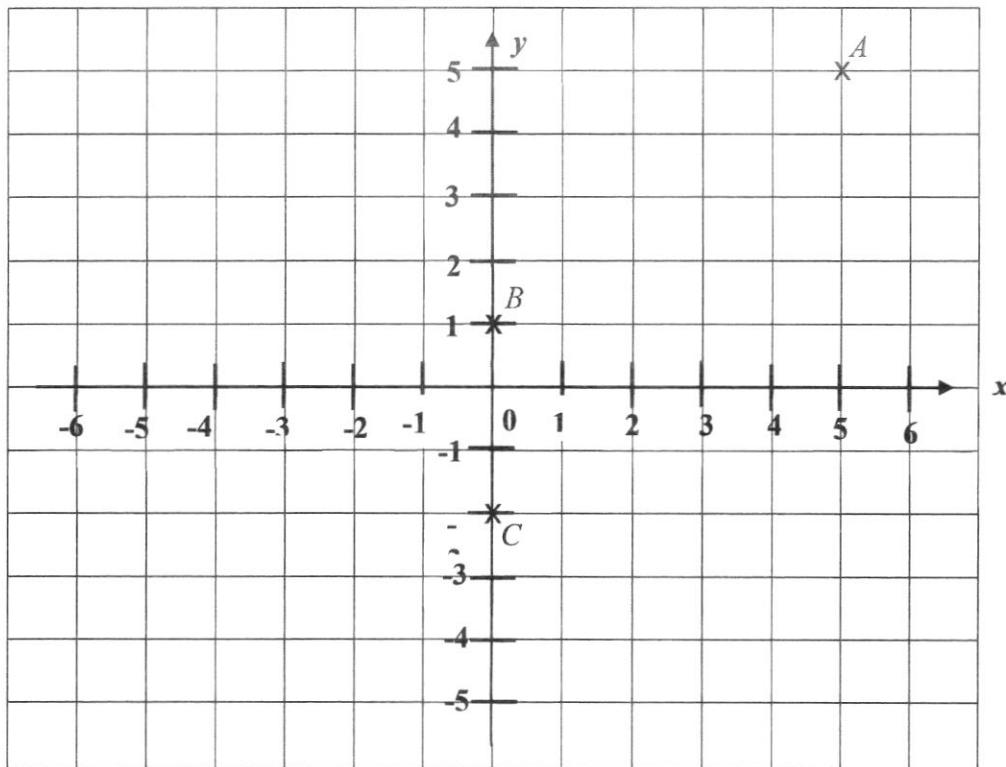


Answer $x = \dots$ [3]

- (b) Each exterior angle of a regular polygon is 18° . Find the number of sides of the polygon.

Answer [1]

- 7 The diagram shows a cartesian plane.



- (a) State the coordinates of the point A .

Answer $A(\dots, \dots)$ [1]

- (b) Find the gradient of the straight line that join A and B .

Answer [1]

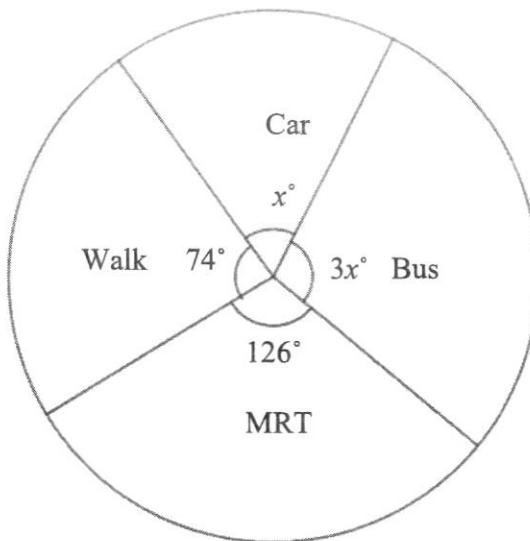
- (c) Plot and label a possible point D on the above grid such that the $ABCD$ is a parallelogram.

Answer Refer to diagram...[1]

- (d) Hence, find the area of the parallelogram.

Answer units² [1]

- 8 A group of students were surveyed to determine how they travelled to school. Their choices were represented on a pie chart as given below.



- (a) Find the value of x .

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

- (b) Calculate the percentage of the students who travel to school by MRT.

Answer% [2]

- (c) If 204 students travel to school by bus, find the total number of students surveyed.

Answer [2]

- 9 Ahmad bought several thumb-drives at \$32 each and twice as many calculators as the thumb-drives at \$43 each. Let x be the number of thumb-drives purchased.

(a) If the total bill was \$1534, write down an equation in terms of x .

Answer [1]

(b) Hence, find the total number of calculators purchased.

Answer [3]

- 10** The following readings, in $^{\circ}\text{C}$, are the temperatures of several freezers recorded by health officers in a food court:

– 1.6, – 0.5, 0.2, – 2.1, – 1.5 – 0.7, 0.4, – 1.2

- (a) Find the difference between the highest and lowest temperature.

Answer $^{\circ}\text{C}$ [2]

- (b) Average temperature of the freezers = $\frac{\text{Sum of all temperatures of the freezers}}{\text{Total number of freezers}}$.

Using this information, calculate the average temperature of the freezers.

Answer $^{\circ}\text{C}$ [2]

- 11 (a) Tim can paint 8 fence panels in 5 hours. Paul can paint 3 fence panels in 2 hours. Tim and Paul work together to paint a total of 18 panels. Assuming they continue to paint at the same rate, how long will it take them to paint the 18 panels? Give your answer in hours and minutes, to the nearest minute.

Answer h..... min [3]

- (b) If P is decreased by 20% and then increased by 40%, find the percentage change in P .

Answer % [2]

12 A deer can run at an average speed of 78 km/h.

(a) What is the average speed of the deer in m/s?

Answer m/s [2]

(b) How many seconds will the deer take to run a distance of 980 meters?

Answer s [2]

13 Consider the number pattern

Line	Column 1	Column 2	Column 3
1 st line	$1 + 3$	= 4	$= 2 \times 2$
2 nd line	$1 + 3 + 5$	= 9	$= 3 \times 3$
3 rd line	$1 + 3 + 5 + 7$	= 16	$= 4 \times 4$
4 th line	$1 + 3 + 5 + 7 + 9$	= 25	$= 5 \times 5$
	⋮		

(a) Write down the sixth line in the pattern.

Answer [1]

(b) Find an expression, in terms of n , for the n th line.

Answer [1]

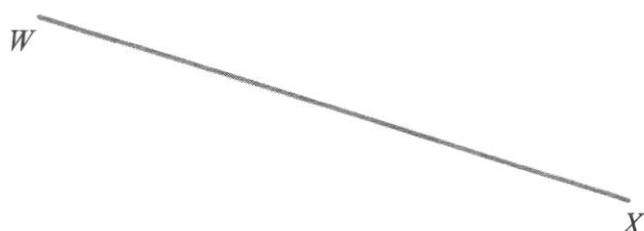
(c) Would there be a line with 1000 in column 2? Explain your answer.

Answer because

..... [2]

- 14 (a) Construct a quadrilateral $WXYZ$ where $XY = 7.9$ cm, $WZ = 10.2$ cm, $\angle WXY = 112^\circ$ and $\angle ZWX = 68^\circ$. WX has already drawn for you.

Answer



[3]

- (b) What is the special name of the quadrilateral $WXYZ$?

Answer [1]

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

Answer cm [1]

End of Paper



KRANJI SECONDARY SCHOOL

Sec 1 (G3)
Session 1

END – OF – YEAR EXAMINATIONS 2022

MATHEMATICS 4052

PAPER 2

Level : Secondary One

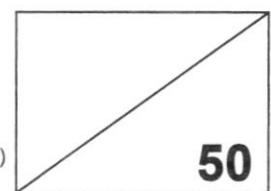
Date : 28 Sept 2022

Course : G3

Duration : 1 hour 15 minutes

Name : _____ () **Marks** :

Class : Secondary 1 _____
Grouping - *Alpha / Beta / Kappa / Sigma (*circle accordingly)



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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.

Setter: Mdm J Mah

This paper consists of 13 printed pages, including the cover page.

[Turn over]

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

$$0.\dot{2}, \quad \pi, \quad \sqrt[3]{27}, \quad 3\frac{5}{8}, \quad (-0.2)^2$$

- (b) Written as the product of its prime factors $2520 = 2^3 \times 3^2 \times 5 \times 7$.

- (i) Express 336 as a product of its prime factors.

Answer [1]

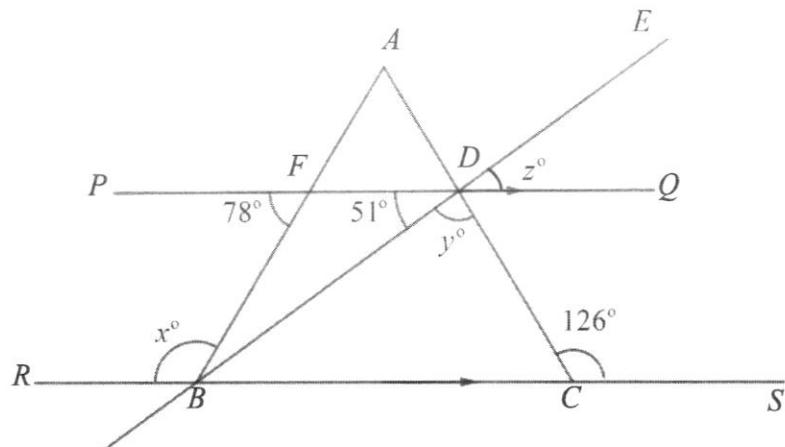
- (ii) The number $2520k$ is a perfect square. Find the smallest positive integer value of k .

Answer $k = \dots$ [1]

- (iii) Find the smallest positive integer h for which $336h$ is a multiple of 2520.

Answer $h = \dots$ [1]

- 2 In the diagram given below, PQ and RS are parallel and BDE is a straight line.



Find x , y and z giving **reasons** for each answer.

Answer $x = \dots$

$y = \dots$

$z = \dots$ [5]

3 (a) Write and simplify the algebraic expression for each of the following statements.

(i) The product of $2xy$ and $5y$.

Answer [1]

(ii) Subtract the square root of p from the cube of q .

Answer [1]

(b) Factorise completely

(i) $28x - 16y + 8$,

Answer [1]

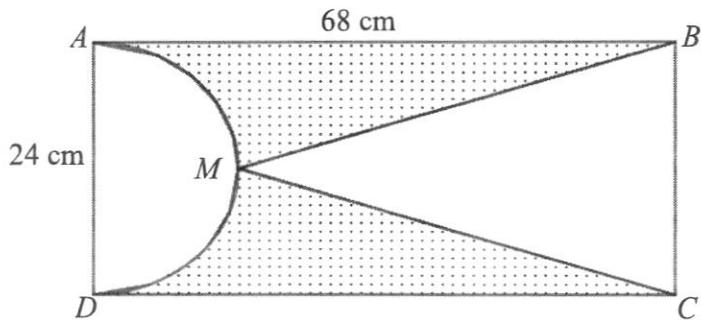
(ii) $-9p^2 - 72pq$.

Answer [1]

- 4 (a) Express 18000 cm^3 in m^3 .

Answer m^3 [2]

- (b) $ABCD$ is a rectangle of length 68 cm and breadth 24 cm. M is the midpoint of semicircular arc AMD . BMC is a triangle. Find the area of the shaded region.



Answer cm^2 [4]

- 5 Bill has some red marbles, blue marbles and green marbles.
The ratio of red marbles to blue marbles that he has is 3 : 4 and the ratio of red marbles to green marbles that he has is 4 : 5.
- (a) Find the ratio of blue marbles to green marble that he has in its simplest form.

Answer : [2]

After Bill exchanged 5 blue marbles and 2 green marbles with a friend for red marbles, he will have equal number of red, blue and green marbles.

- (b) Calculate the total number of marbles that Bill has.

Answer marbles [2]

- 6 (a) Expand and simplify $5(p + 3q) - 2(3p - q)$.

Answer [2]

- (b) Solve the equation $3(a - 4) - 2 = 5 - a$.

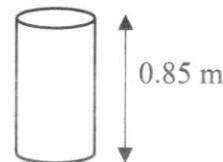
Answer $a = \dots$ [2]

- (c) Express $\frac{3y - 6x}{4} + \frac{8x + y}{5}$ as a single fraction in its simplest form.

Answer [3]

- 7 In a factory, liquid waste is poured into cylindrical drums. The volume of the cylindrical drum is 0.255 m^3 and its height is 0.85 m .

- (a) Calculate the radius of the cylindrical drum.

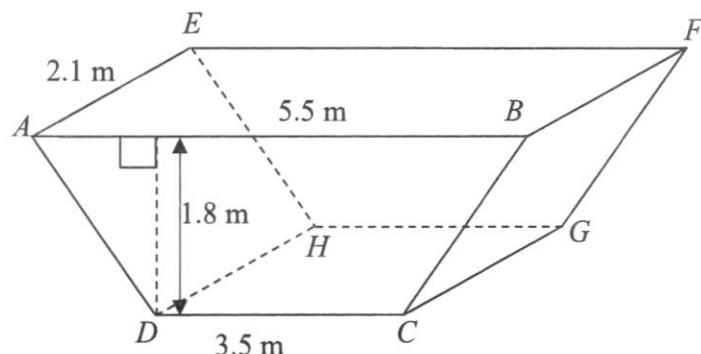


Answer m [2]

When full, the drums are emptied into a tank as shown in the diagram below. Both the bottom of the tank, $DCGH$ and its top, $ABFE$, are rectangles.

The vertical sides $ABCD$ and $EFGH$ are identical trapeziums.

$DC // AB, EF // HG, AB = EF = 5.5 \text{ m}, DC = HG = 3.5 \text{ m}, AE = BF = CG = DH = 2.1 \text{ m}$ and the perpendicular height of the tank is 1.8 m .



- (b) Calculate

- (i) the area of the trapezium $ABCD$.

Answer m^2 [1]

(ii) the volume of the tank.

Answer m^3 [1]

(c) How many full drums of waste can be emptied into the tank?

Answer [2]

- 8 (a) Mr Heng decides to deposit \$3000 into a bank that pays simple interest at 1.45% per annum. After 3 years, he withdraws all the money from the bank. How much money did Mr Heng withdraw?

Answer \$..... [2]

- (b) Mr Heng saw an advertisement for a laptop. He decides to buy the laptop on hire purchase.

<u>Cash Price</u> \$3198.00 <u>Hire Purchase Terms</u> 15% deposit + 18 monthly payments of \$158	
----------------------------------------------------------------------------------------------------------------------	-------------------------------------------------------------------------------------

- (i) What is the total amount that Mr Heng pays for the laptop if he buys it on hire purchase?

Answer \$..... [2]

- (ii) Find the extra cost of buying the laptop on hire purchase as a percentage of the cash price.

Answer% [3]

- 9 (a) London is 7 hours behind Singapore and it takes 13 hours 58 minutes to reach London by air. If the aircraft leaves Singapore at 1:00 pm on Tuesday, state time and the day it will reach London according to London's local time.

Answer on [1]
(time) (day)

- (b) The exchange rate between Singapore dollars (\$) and euros (€) is \$1=€ 0.72
The exchange rate between pounds (£) and Singapore dollars is £1=\$1.65.

Tom is planning a trip to Europe with Jerry.
He finds the following hotel prices on a website.

London Hotel £185 per night
Italy Hotel €185 per night

- (i) By comparing the exchange rates, explain how you can tell that the hotel in London costs more per night than the hotel in Italy.

Answer

.....

[2]

- (ii) Tom books 4 nights in a London hotel and 3 nights in the hotel in Italy.
He pays using his credit card.
The credit card company charges a fee of 2.8 % for the currency conversion.
Jerry will pay $\frac{2}{3}$ of the cost of the accommodation.
Suggest a suitable amount for Tom to ask Jerry to pay in Singapore dollars.
Justify the decision you make and show your calculations clearly.

Answer

..... [4]

End of Paper

2022 Sec 1 G3 EOY Paper 1

1	The diagram shown should be the same size as the number of bicycles produced has doubled and not the size of the bicycle. Or 2020 should show 2 bicycles of the same size instead of a bigger bicycle. Or The number of bicycle is represented by a bicycle with no values. It is difficult to determine the number of bicycle have double from the size.								
2	$T = \frac{17.348(2.14+4)}{6-2.14} = 27.5950 = 27.60$								
3	$\frac{\sqrt{49.8 \times 7.9}}{3.5} = \frac{\sqrt{50 \times 8}}{4} = 5$								
4	<table style="margin-left: 20px; border-collapse: collapse;"> <tr> <td style="padding: 2px;">3</td> <td style="padding: 2px;">126, 189, 252</td> </tr> <tr> <td style="padding: 2px;">3</td> <td style="padding: 2px;">42, 63, 84</td> </tr> <tr> <td style="padding: 2px;">7</td> <td style="padding: 2px;">14, 21, 28</td> </tr> <tr> <td style="padding: 2px;"></td> <td style="padding: 2px;">2, 3, 4</td> </tr> </table> <p>Greatest possible number of students = 63 cm.</p>	3	126, 189, 252	3	42, 63, 84	7	14, 21, 28		2, 3, 4
3	126, 189, 252								
3	42, 63, 84								
7	14, 21, 28								
	2, 3, 4								
5a	$22\frac{3}{4}\% = \frac{91}{400}$								
5b	$\frac{14g}{8000g} \times 100\% = 0.175\%$								
6a	Sum of interior angles of a pentagon = $(5-2) \times 180 = 540^\circ$ $x + x + 28 + 2x + 160 + 80 = 540$ $4x = 68$								
6b	Number of sides = $\frac{360}{18} = 20$								
7a	(5,5)								
7b	$\frac{4}{5}$ or 0.8								
7c	On the diagram, D (5,2)								
7d	Area = 15 sq units								

8a	$x + 3x + 74 + 126 = 360$: $x = 40$
8b	$\frac{126}{360} \times 100\% = 35\%$
8c	$\frac{204}{3x} \times 360 = \frac{204}{120} \times 360 = 612$
9a	$32x + 2x(43) = 1534$
9b	$32x + 2x(43) = 1534$ $118x = 1534$ $x = \frac{1534}{118} = 13$ No. of calculators = 26
10a	$0.4 - (-2.1) = 2.5^\circ C$
10b	Average = $\frac{-1.6 - 0.5 + 0.2 - 2.1 - 1.5 - 0.7 + 0.4 - 1.2}{8} = -1.875^\circ C$
11a	In 1 hour, Tim paints 1.6 panels In 1 hour, Paul paints 1.5 panels In 1 hour, both paint 3.1 panels Time taken to paint 18 panels = $\frac{18}{3.1} = 5.806452h = 5h\ 48\text{min}$
11b	New $P = 0.8P \times \frac{140}{100} = 1.12P$ Percentage change in $P = \frac{1.12P - P}{P} \times 100\% = 12\%$
12a	$78\text{ km/h} = \frac{78 \times 1000}{60 \times 60} = 21\frac{2}{3} = 21.7\text{ m/s (3sf)}$
12b	$\frac{980}{\left(21\frac{2}{3}\right)} = 45.2309\text{ (4dp)} = 45.2\text{ s (3sf)}$

13a	$1 + 3 + 5 + 7 + 9 + 11 + 13 = 49 = 7 \times 7$
13b	$T_n = (n+1)^2$
13c	No because 1000 is not a perfect square/ square number . OR $(n+1)^2 = 1000$ $n = \sqrt{1000} - 1 \approx 30.6$ Since n is not a positive integer , 1000 is not a term in the pattern.
14a	<p>A diagram of a trapezium WXYZ. The top side WZ is solid, and the bottom side XY is dashed. The left side WX is labeled "10.2 cm" and the right side XY is labeled "7.9 cm". At vertex W, there is an angle symbol with a dashed arc, and at vertex X, there is another angle symbol with a dashed arc. The angle at W is labeled "68°" and the angle at X is labeled "10°".</p>
14b	Trapezium
14c	$WY=13.7 \text{ cm } +/- 0.1 \text{ cm}$; (13.6 to 13.8) must match diagram