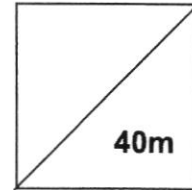


Name: _____ ()

Class: 2T1



GREENDALE SECONDARY SCHOOL
End-of-Year Examination 2018

MATHEMATICS SYLLABUS T

4046/01

Paper 1

5 October 2018

Secondary 2 Normal (Technical)

1 hour 15 minutes

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

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

Write in dark or blue pen.

You may use a soft 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 may result in loss of marks.

You are expected to use a scientific calculator to evaluate explicit numerical expressions.

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 .

At the end of the examination, fasten all your work securely together.

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

The total number of marks for this paper is **40**.

Question	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Strand	N	M	M	G	N	A	N	N	N	M	N
Marks											

This document consists of 11 printed pages, including this cover page.

Mathematical Formulae

Compound Interest

$$\text{Total amount} = P \left(1 + \frac{r}{100} \right)^n$$

Quadratic equation $ax^2 + bx + c = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Geometry and Measurement

$$\text{Curved surface area of a cone} = \pi r l$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

$$\text{Volume of a cone} = \frac{1}{3} \pi r^2 h$$

$$\text{Volume of a pyramid} = \frac{1}{3} \times \text{base area} \times \text{height}$$

$$\text{Volume of a sphere} = \frac{4}{3} \pi r^3$$

Answer **all** questions.

1 Write the number 78.347 correct to

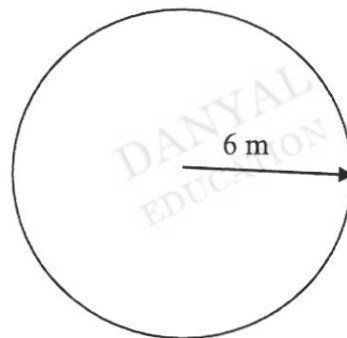
(a) 3 significant figures,

Answer (a) [1]

(b) 2 decimal places.

Answer (b) [1]

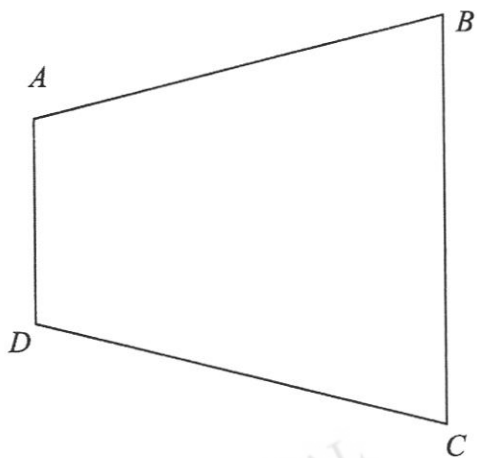
2 The diagram shows a cross section of the underground MRT tunnel.
The actual tunnel has a radius of 6 m.



Find the circumference of the tunnel.

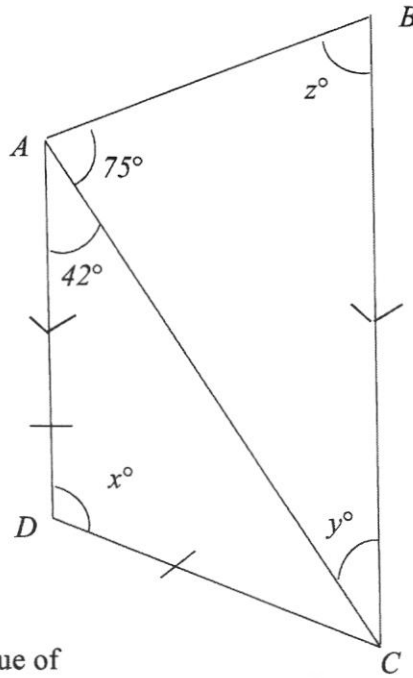
Answerm [2]

3



- (a) Draw the perpendicular bisector of the line BC . [2]
- (b) Draw the bisector of angle ADC . [2]
-

- 4 In trapezium $ABCD$, AD is parallel to BC , $AD = DC$, angle $DAC = 42^\circ$ and angle $CAB = 75^\circ$.



Find the value of

- (a) x ,

- (b) y ,

- (b) z .

Answer (a) [1]

Answer (b) [1]

Answer (c) [1]

- 5 Three workers shared a special bonus of \$4500 in the ratio 6 : 4 : 5.
Find the biggest share of the bonus.

Answer[2]

- 6 Solve this equation.

$$\frac{4x+2}{5} = 14$$

Answer $x =$ [3]

7 (a) Calculate 35% of \$1500.

Answer (a) \$..... [2]

(b) Find \$25 as a percentage of \$125.

Answer (b)% [2]

8 The MRT train travels 60 000 metres in 40 minutes.
Calculate the train's average speed in

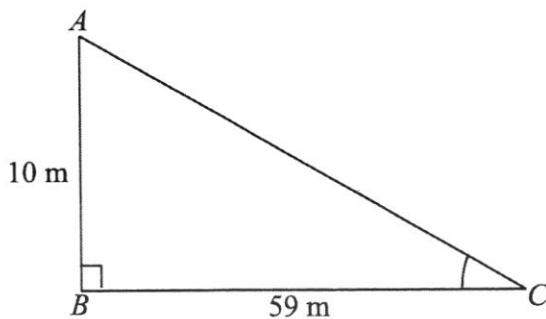
(a) metres per second,

Answer (a) m/s [2]

(b) kilometres per hour.

Answer (b) km/h [2]

9 In the diagram below, AC represents the snow slide at Snow City.



(a) Calculate the length of the slide AC .

Answer (a)m[2]

(b) Calculate the area of $\triangle ABC$.

Answer (b) m² [2]

10



A strawberry biscuit is made in the shape of a cylinder with radius 0.3 cm and length 10 cm. Calculate

(a) the volume of the biscuit.

Answer (a) cm³ [2]

(b) the curved surface area of the biscuit that is coated with strawberry cream.

Answer (b)cm² [2]

11 The Singapore-Batam Ferry timetable and fares are shown below.

Singapore (depart)	0905	1105	1400	1730	2030
-------------------------------	------	------	------	------	------

Fares (per round trip)	Mon - Thu	Fri, Sat, Sun
Adult	\$58.50*	\$68.50*
Child	\$51.50*	\$60.50*

* daily fares

(a) Singapore passengers are required to check in no later than 40 minutes before departure.

What is the latest time that a passenger can check in for the first ferry?

Answer (a) [1]

(b) The 11 05 crossing took 45 minutes.

What time, using Singapore time, did it arrive in Batam?

Answer (b) [1]

(c) Miss Tan makes one round trip every day from Monday to Friday for 7 weeks.

How much money will she save if she buys a pass, valid for 35 round trips, priced at \$1800?

Answer (c) \$ [3]

(d)

<p>SPECIAL FAMILY OFFER</p> <p>ROUND TRIP FARES</p> <p>\$41.90 per adult \$32.40 per child</p>
--

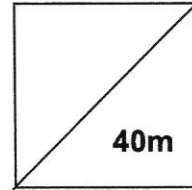
Mr and Mrs Pek and their three children travel from Singapore to Batam for a holiday, using the special family offer.

Calculate the cost of the round trip for the family.

Answer (d) \$ [3]

Name: _____ ()

Class: 2T1



GREENDALE SECONDARY SCHOOL
End-of-Year Examination 2018

MATHEMATICS SYLLABUS T

4046/02

Paper 2

2 October 2018

Secondary 2 Normal (Technical)

1 hour 15 minutes

Candidates answer on the Question Paper.

READ THESE INSTRUCTIONS FIRST

Write your index number and name on all the work you hand in.
Write in dark or blue pen.
You may use a soft 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 may result in loss of marks.
You are expected to use a scientific calculator to evaluate explicit numerical expressions.
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At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [] at the end of each question or part question.
The total number of marks for this paper is **40**.

Question	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11
Strand	N	N	S	A	N	S	N	P	N	S	N
Marks											

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Mathematical Formulae

Compound Interest

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Quadratic equation $ax^2 + bx + c = 0$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Answer **all** questions.

1 Calculate

(a) $\sqrt[3]{456.32}$,

Answer (a) [1]

(b) $\frac{4.52+1.17}{6.13-2.38}$.

Answer (b) [1]

2 (a) Find the value of 2^4 .

Answer (a) [1]

(b) Simplify the ratio 15 : 125.

Answer (b) : [1]

3 These are Roy's 10 homework marks.

9 8 7 6 4 5 3 5 4 7

Calculate his mean mark.

Answer [2]

4 Simplify

(a) $2x - y + 5x + 7y$,

Answer (a) [1]

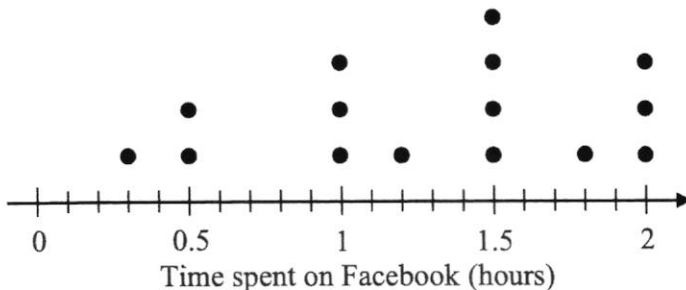
(b) $4x + 3(1 + 5x)$.

Answer (b) [2]

5 Find 48 cm as a percentage of 5 metres.
Show your working.

Answer%[3]

- 6 The dot diagram shows the time spent on Facebook by a group of 15 students in a week.



- (a) Find the modal time.

Answer (a)hours [1]

- (b) How many students spent more than 1.5 hours on Facebook in a week?

Answer (b) [1]

- (c) Find the median time.

Answer (c)hours [1]

*For Examiner's
Use Only*

- 7 Karen borrows \$5000 from a bank at 3% per year compound interest.
Find the total amount Karen has to pay back to the bank if she takes a 4-year loan.
Give your answer correct to the nearest dollar.

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EDUCATION

DANYAL
EDUCATION

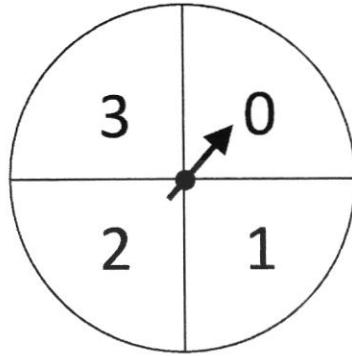
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EDUCATION

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EDUCATION

DANYAL
EDUCATION

Answer \$..... [3]

- 8 (a) The diagram shows a fair spinner.
David spins the spinner once.



Find the probability that David obtains

- (i) number 2,

Answer (a)(i) [1]

- (ii) number 8,

Answer (a)(ii) [1]

- (iii) an odd number.

Answer (a)(iii) [1]

- (b) A card is chosen at random from a box.
There are 4 blue and 13 yellow cards in the box.
What is the probability of choosing a blue card?

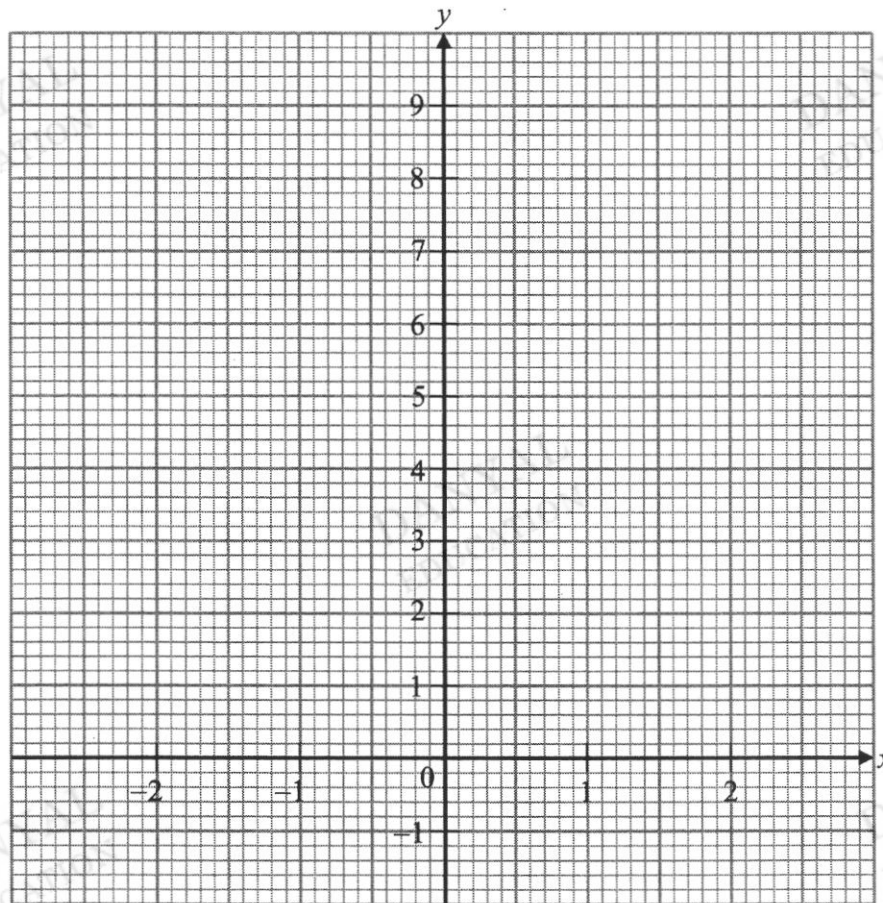
Answer (b) [1]

9 (i) Complete the table of values for $y = 2x + 5$.

x	-2	0	2
$y = 2x + 5$		5	

[2]

(ii) Draw the graph of $y = 2x + 5$.

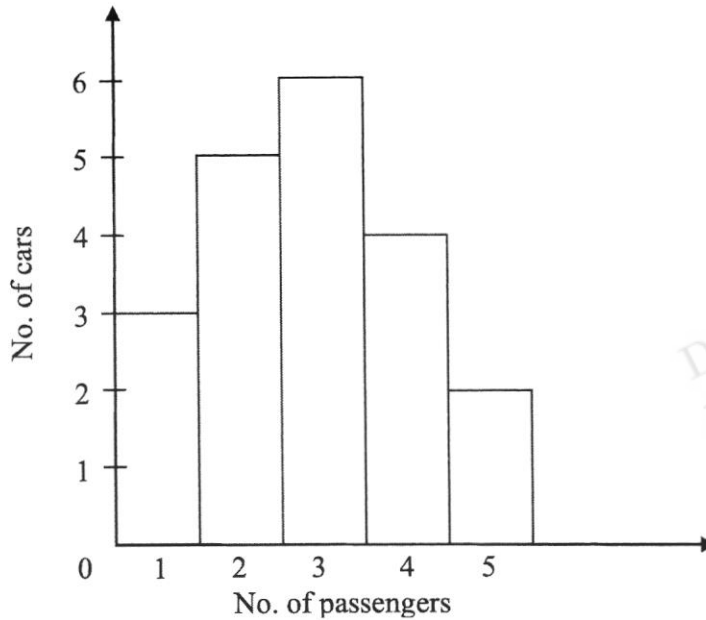


[2]

(iii) Use your graph to find the value of x when $y = 6$.

Answer (iii) $x = \dots\dots\dots$ [1]

10 The histogram below illustrates the results of a survey to find the number of passengers in each car along KPE expressway.



(a) Calculate the total number of cars.

Answer (a) [1]

(b) Calculate the total number of passengers.

Answer (b)..... [2]

(c) Find the fraction of cars with more than 3 passengers.

Answer (c).....[1]

(d) One of the cars is selected at random.

What is the probability that there are 2 passengers in the car selected?

Answer (d) [1]

11

$$\text{Chargeable Income} = \text{Total Income for the year} - \text{Total tax relief}$$

Mr Koh earns \$4500 per month.

His total tax relief is \$12 400 for the year.

(a) (i) Calculate his total income for the year.

Answer (a)(i) \$..... [1]

(ii) Calculate his chargeable income for the year.

Answer (a)(ii) \$..... [1]

(b) Mr Koh pays tax according to the rule:

\$300 on the first \$30 000 of chargeable income
and 4.5% on the remainder of chargeable income

Calculate how much tax he pays for the year.

Answer (b)\$[3]

(c) Mr Koh decides to go for a self-drive holiday trip in Penang.

The car hire company charges \$58 per day for the first 7 days of hire and \$35 for every additional day. The company also charges an insurance fee of \$6 per day. Mr Koh hires a car for 13 days.

Calculate

(i) the amount of the insurance cost,

Answer (c)(i) \$[1]

(ii) the total amount that he needs to pay.

Answer (c)(ii) \$[2]

End of Paper

Qn	Mark Scheme	Marks
1a	78.3	B1
1b	78.35	B1
2	Circumference, $2 \times \pi \times r$ $= 2 \times 3.142 \times 6$ $= 37.7m$	M1 M1
3a	Answer on question paper	Full labelling, G1 Show construction lines, G1
3b	Answer on question paper	Full labelling, G1 Show construction lines, G1
4a	$\angle x = 180 - 42 - 42(\text{isos.}\Delta)$ $= 96^\circ$	B1
4b	$\angle y = 42^\circ(\text{alt.}\angle, // \text{ lines})$	B1
4c	$\angle z = 180 - 75 - 42$ $= 63^\circ$	B1
5	$15 \text{ u} \text{ -----} \rightarrow \4500 $1 \text{ u} \text{ -----} \rightarrow \300 $6 \text{ u} \text{ -----} \rightarrow \300×6 $= \$1800$	M1 A1
6	$\frac{4x+2}{5} = \frac{14}{1}$ $4x+2 = 14 \times 5$ $4x+2 = 70$ $4x = 68$ $x = 17$	M1 M1 A1

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7a	$35\% \times 1500$ $= \frac{35}{100} \times 1500$ $= \$525$	M1 A1
7b	$= \frac{25}{125} \times 100\%$ $= 20\%$	M1 A1
8a	$s = \frac{D}{T}$ $= \frac{60000m}{40 \text{ min}}$ $= \frac{60000 \div 1000km}{40 \div 60h}$ $= 90km / h$	M1 A1
8b	$s = \frac{D}{T}$ $= \frac{60000m}{40 \text{ min}}$ $= \frac{60000m}{40 \times 60s}$ $= 25m / s$	M1 A1
9a	$AC = \sqrt{10^2 + 59^2}$ $= 59.841$ $= 59.8m$	M1 A1
9b	$\text{Area, } \Delta = \frac{1}{2} \times b \times h$ $= \frac{1}{2} \times 59 \times 10$ $= 295m^2$	M1 A1
10a	<p>Vol of cylinder</p> $= \pi \times r^2 \times h$ $= 3.142 \times 0.3^2 \times 10$ $= 2.8274$ $\approx 2.83cm^3$	M1 A1

Qn	Mark Scheme	Marks
1a	$7.6988 \approx 7.70$	B1
1b	1.52	B1
2a	16	B1
2b	3 : 25	B1
3	Mean $= \frac{9+8+7+6+4+5+3+5+4+7}{10}$ $= 5.8$	M1 A1
4a	$7x+6y$	B1
4b	$4x+3+15x$ $= 19x+3$	M1 A1
5	$5m = 500 \text{ cm}$ $\frac{48}{500} \times 100\%$ $= 9.6\%$	M1 M1 A1
6a	Modal time = 1.5 h	B1
6b	4 students	B1
6c	Frequency = 15 students, $\frac{15}{2}$ $= 7.5$ (approx. 8 th position) Median = 1.5 h	B1

7	Total amount $= P(1 + \frac{r}{100})^n$ $= 5000(1 + \frac{3}{100})^4$ $= 5627.544$ $= \$5628$	 M1 M1 A1
8ai	$\frac{1}{4}$	B1
aii	0	B1
aiii	$\frac{2}{4} = \frac{1}{2}$	B1
b	$\frac{4}{17}$	B1
9ai	$y = 1$	B1
ai	$y = 9$	B1
aii	Answer on graph paper	G1 – correct points G1 – accurate str. line
aiii	$x = 0.5$	
10a	Total no. of cars = $3 + 5 + 6 + 4 + 2$ $= 20$	B1
10b	Total no. of passengers $= 1 \times 3 + 2 \times 5 + 3 \times 6 + 4 \times 4 + 5 \times 2$ $= 57$	M1 A1
10c	$\frac{4+2}{20} = \frac{3}{10}$	B1
10d	$\frac{5}{20} = \frac{1}{4}$	B1

