

Student Name _____

Class _____



THE KING'S SCHOOL

**August 2016
Preliminary Course Examination**

Mathematics General Year 11

General Instructions

- Reading time – 5 minutes
- Working time – 2 hours
- Write using black pen
- Draw diagrams using pencil.
- Board-approved calculators may be used.
- A Formulae and Data Sheet is provided separately.
- Show all necessary working in Questions 21-25.

DTS/JAS

Total marks – 84

Section I

20 marks

- Attempt Questions 1-20
- Answer on the Multiple Choice Answer Sheet provided.
- Allow about 30 minutes for this Section.

Section II

60 marks

- Attempt Questions 21-25
- Allow about 90 minutes for this Section.

<i>Examiners' Use Only</i>						
Question	Algebra and Modelling	Data and Statistics	Financial Mathematics	Measurement	Probability	Total
1-20	13, 14, 15 /3	6, 7, 8 /3	1,2,3, 18, 19, 20 /6	9, 10, 11, 12, 16, 17 /6	4, 5 /2	/20
21			a, b /6		c, d, e /6	/12
22		a, b, c /7		d, e /5		/12
23	a, b, c /10		d /2			/12
24				a, b, c /10	d /2	/12
25	a /5	b /5	c /2			/12
Total	/18	/15	/16	/21	/ 10	/80

Section I

20 marks

Attempt Questions 1-20

Allow about 25 minutes for this section

Use the Multiple Choice answer sheet for Questions 1-20

1 Dianne writes a cookbook.

Booksellers buy the book for \$17.00 per copy and sell it for \$35.00 per copy.

Dianne receives a royalty of 12% of the final selling price of the book.

How much would she receive in royalties if there were 2000 copies printed which all sell at full price?

- (A) \$4 080.00
- (B) \$4 320.00
- (C) \$8 400.00
- (D) \$12 480.00

2 The table below gives the compounded value of \$1 for various interest rates and periods.

		Compounded values of \$1			
		Periods			
Interest Rate per period	1	2	3	4	
1%	1.010	1.020	1.030	1.041	
5%	1.050	1.103	1.158	1.216	
10%	1.100	1.210	1.331	1.461	
15%	1.150	1.323	1.521	1.750	
20%	1.200	1.440	1.728	2.074	

Heather invested \$2 560 in an account paying 15% p.a. compound interest.

What is the value of the investment after four (4) years?

- (A) \$2 664.96
- (B) \$2 944.00
- (C) \$4 480.00
- (D) \$5 309.44

3 Holly had a gross annual income of \$88 000.

She receives a 17½% holiday loading on four (4) weeks normal wages.

Her four (4) weeks holiday pay, including the loading, is

- (A) \$296.15
- (B) \$1 692.31
- (C) \$1 184.62
- (D) \$7 953.85

4 The table below shows the results for five (5) players, who competed in a number of events.

Player Name	Number of Events	Number of Wins
Jake	50	35
Robbie	50	45
Michael	45	27
Cameron	40	28
Beau	60	30

Based on the results, which two (2) players would be equally likely to win a future event?

- (A) Beau and Michael
- (B) Cameron and Jake
- (C) Jake and Michael
- (D) Michael and Robbie

5 In a game of chance, there is a pack of 60 cards.

There are 27 cards which result in the player gaining points.

There are 18 cards which result in the player losing points.

The remainder of the cards result in no points either way.

When the first card is drawn from the pack, what is the probability that the player will **not** lose points.

- (A) $\frac{9}{20}$
- (B) $\frac{11}{20}$
- (C) $\frac{7}{10}$
- (D) $\frac{3}{4}$

6 The town of Upper River has a population of 8 400 people of voting age.

The population is divided evenly between males and females, and of the females, 32% are aged between 18 and 30.

A survey of voting intentions is being conducted using a stratified sample size of 400.

How many females, aged between 18 and 30, should be included in the survey group?

- (A) 64
- (B) 128
- (C) 160
- (D) 1344

7 Which is the correct five figure summary for the set of data below?

21, 3, 11, 5, 15, 7, 11, 19, 4, 3

- (A) 3, 4, 7, 15, 20
- (B) 3, 4, 7, 15, 21
- (C) 3, 4, 9, 15, 20
- (D) 3, 4, 9, 15, 21

8 John collected data on the time spent on breaks (in minutes) during a day by the twenty (20) members of his staff.

He calculates the summary statistics below from his data.

Mean	20
Median	20
Mode	21
Range	21

When he adds his own result, which was twenty (20) minutes, which of the above values could change.

- (A) The mean
- (B) The median
- (C) The mode
- (D) The range

9 A distance known as an Astronomical Unit (AU) $\approx 1.496 \times 10^8$ km.

In December 2016, an asteroid (called 2015 YQ1) will approach to be 0.0158 AU from Earth!

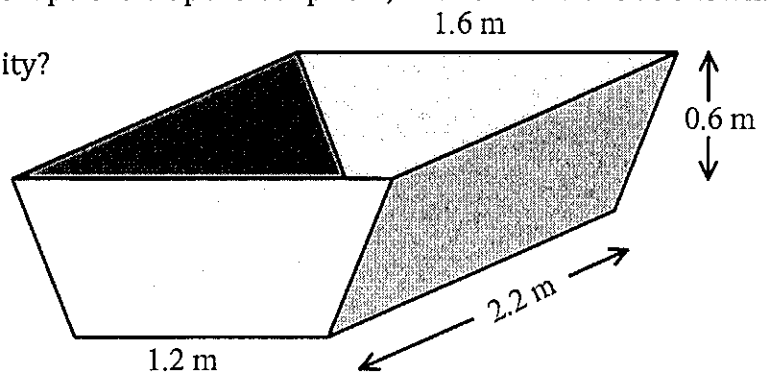
What is this distance in kilometres, correct to three (3) significant figures?

- (A) 2.36×10^6
- (B) 2.37×10^6
- (C) 2.36×10^7
- (D) 2.37×10^7

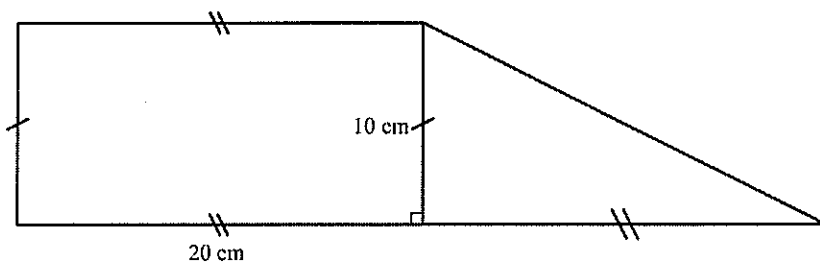
10 A drinking trough for animals is in the shape of a trapezoidal prism, with dimensions as shown.

When completely full, what is its capacity?

- (A) 1 584 Litres
- (B) 1 848 Litres
- (C) 2 112 Litres
- (D) 3 696 Litres

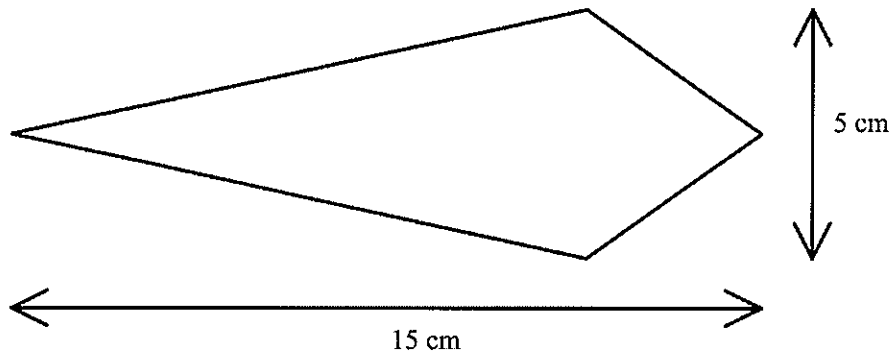


11 What is the perimeter of this compound shape?



- (A) 70.14 cm
- (B) 92.36 cm
- (C) 92.37 cm
- (D) 101.14 cm

12 What is the area of this kite?



- (A) 37.5 cm^2
- (B) 75 cm^2
- (C) 100 cm^2
- (D) 205 cm^2

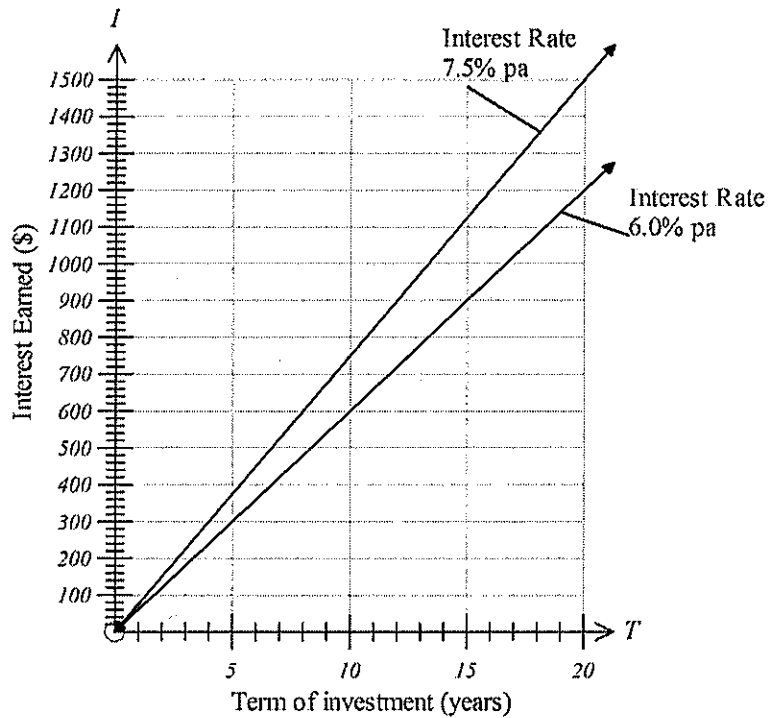
13 Expand and simplify: $3x^2 - 2x(5 - 4x) + 8x$

- (A) $3x^2 - 3x$
- (B) $11x^2 - 2x$
- (C) $3x^2 + 6x$
- (D) $11x^2 + 2x$

14 Solve: $5x = 7x - 24$

- (A) $x = -12$
- (B) $x = -2$
- (C) $x = 2$
- (D) $x = 12$

- 15 The graph shows the interest earned on an investment of \$1 000 at two (2) different interest rates, for terms up to twenty (20) years.



How many extra years would it take to earn \$900 in interest if the investment was at 6.0% p.a. compared with being at 7.5% p.a.?

- (A) 3 years
 - (B) 4 years
 - (C) 5 years
 - (D) 6 years
- 16 Herbert has signed up for this mobile phone plan.

PLAN COST PER MONTH - \$35

Included in the Plan: 200 standard calls up to 2 minutes, unlimited SMS, 1.5 GB of data.

Excess calls 40c plus 50c per 30 seconds or part thereof.

Excess data 65c per megabyte

During the month of June, Herbert makes 190 standard calls which are all less than 2 minutes in length, sends 250 SMS messages and uses an average of 54.8 megabytes of data per day.

What will the plan cost him for the month of June?

- (A) \$35.00
- (B) \$70.20
- (C) \$105.20
- (D) \$128.60

- 17 Hamish has an external hard drive which he is using to back-up his data. The hard drive has a capacity of 0.5 terabytes.

Hamish currently has 480 GB of data stored on the external hard drive.

Over a day he backs up the following files to his external hard drive.

Name	Date Modified	Type	Size
MYOB	07/09/16 7:10 PM	Application	1,024,000 KB
Attachments070916	07/09/16 8:15 PM	Win Zip File	46,080 KB
Blaster Force	07/09/16 9:20 PM	Application	1,397,760 KB
Attachments070916(1)	07/09/16 9:30 PM	Win Zip File	153,600 KB

How much space is left on Harry's external hard drive?

- (A) 2.5 GB
 - (B) 3.2 GB
 - (C) 29.4 GB
 - (D) 29.5 GB
- 18 Hadrian works 8 hours at normal time and 2 hours at time-and-a-half. His day's pay is \$440.

Hadrian's hourly rate is

- (A) \$12.50
 - (B) \$20.00
 - (C) \$22.50
 - (D) \$40.00
- 19 The fortnightly living at home rate Youth Allowance for a single person under 18 years is \$220.40

It reduces by 50 cents for every dollar in excess of \$400 earned per fortnight. Hayley is 17, living at home and earning \$420 per fortnight.

Her Youth Allowance is

- (A) \$5.00
- (B) \$210.40
- (C) \$220.40
- (D) \$230.40

20 The single sum to be deposited in an account, if \$10 000 is required in five (5) years' time, with a rate of 3%, compounding quarterly, is

- (A) \$1 611.84
- (B) \$8 611.90
- (C) \$11 611.84
- (D) \$42 478.51

END OF SECTION ONE

<i>Examiners' Use Only</i>						
<i>Question</i>	<i>Algebra and Modelling</i>	<i>Data and Statistics</i>	<i>Financial Mathematics</i>	<i>Measurement</i>	<i>Probability</i>	<i>Total</i>
1-20	13, 14, 15 /3	6, 7, 8 /3	1,2,3, 18, 19, 20 /6	9, 10, 11, 12, 16, 17 /6	4, 5 /2	/20

Student Name

Class

Section II

60 marks

Attempt Questions 21 – 24

Allow about 1 hour and 35 minutes for this section

Answer each question in the appropriate space provided.

Your responses should include relevant mathematical reasoning and/or calculations.

Question 21 (12 marks)

Marks

-
- (a) (i)** Harriet is an accountant who is paid a salary of \$91 000 p.a.
She has 32% of her salary deducted for taxes.

Show that her net weekly pay is \$1 190.

1

-
- (ii)** Harry, Harriet's husband, works as a builder.
He works 35 hours per week at a normal rate of \$25 per hour and averages 4 hours overtime per week at time-and-a-half.

Show that his average weekly pay before tax is \$1 025.

1

Question 21 (a) continues on the next page

- (iii) Harriet and Harry draw up the weekly budget below.
 They need to save \$300 per week for an overseas holiday and also want to put some savings away for the future.
 Harry has 25% of his gross wage deducted for taxation.

Income		Expenses	
Harriet's Gross Salary		Accommodation	\$600
Harriet's Net Salary	\$1 190	Food and groceries	\$360
Harry's Gross Wage	\$1 025	Transport	\$210
Harry's Net Wage		Clothing	\$250
		Entertainment	\$250
		Holidays	\$300
		Savings	\$245

Comment on the budget as it stands, indicating where they have made an error, and suggest what changes might be possible to make the budget work for them.

2

- (b) Horatio invests \$24 500 for 30 months in an account which pays 12% p.a. interest, compounding annually.

(i) What is the value of the investment at the end of the term?

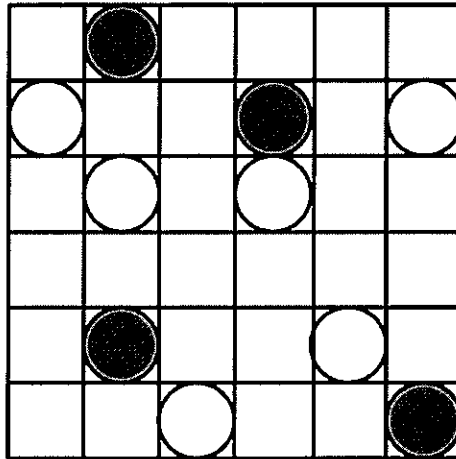
1

(ii) How much more interest would he have earned if the interest had compounded monthly?

1

Question 21 continues on the next page

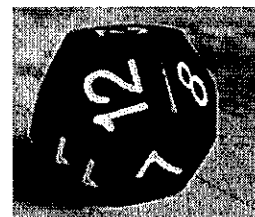
- (c) In a game there are some white counters and some black counters on a grid.
A player chooses a square on the grid at random.



- (i) What is the probability that the square has a white counter on it? 1

- (ii) What is the probability that square has a counter on it? 1

- (d) A dodecahedron die has twelve (12) faces numbered 1 to 12.
The die is rolled once.



- (i) What is the probability that it lands on a number less than 5? 1

- (ii) What is the probability that it does not land on 5, 7 or 10? 1

Question 21 continues on the next page

Question 21 (continued)

Marks

(e) Hanna decides to wear three pieces of jewellery to a concert: a ring, a bangle and a necklace.

	Plain Silver	Plain Gold	Gold or Silver Jewelled	Stone or Wood	Total
Rings	2	3	4	1	10
Bangles	1	1	0	2	4
Necklaces	3	1	3	1	8

The table shows the number of each type of jewellery that she owns.

(i) How many different combinations of the three pieces of jewellery does she have available? 1

(ii) If she decides that she will only wear all plain silver or all plain gold, how many combinations does she have available? 1

End of Question 21

<i>Examiners' Use Only</i>						
Question	<i>Algebra and Modelling</i>	<i>Data and Statistics</i>	<i>Financial Mathematics</i>	<i>Measurement</i>	<i>Probability</i>	<i>Total</i>
21			<i>a, b</i> /6		<i>c, d, e</i> /6	/12

Student Name

Class

Question 22 (15 marks)

Marks

(a) Horatio draws up the questionnaire below, to collect data for a class assignment.

Survey For Class Assignment.	
1.	Gender: (circle) Male / Female
2.	Height _____ cm
3.	Number of Siblings _____
4.	Your estimate of your fitness: (circle one)
	Very fit Fairly fit Passably fit Fairly <u>unfit</u> Very Unfit

(i) Which question in the survey collects categorical, ordinal data?
Explain your answer.

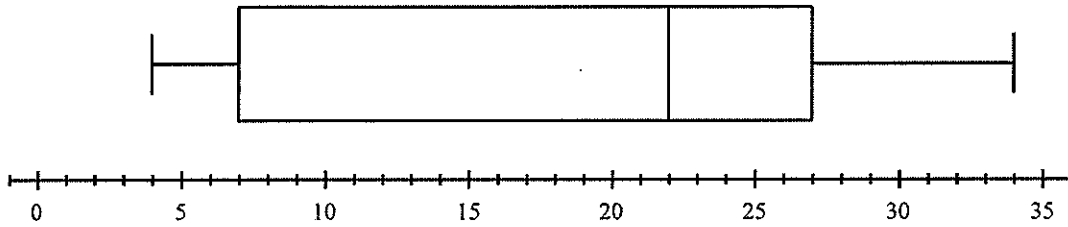
1

(ii) Which question in the survey collects discrete quantitative data?
Explain your answer.

1

Question 22 continues on the next page

(b) The box and whisker plot shows the gross vehicle mass in tonnes (GVM) of trucks crossing a weighbridge on a certain day.



(i) What percentage of the trucks had a GVM between 4 tonnes and 27 tonnes? 1

(ii) What was the interquartile range of the data on the trucks? 1

(c) Two athletes in training have their times for ten 100m sprints recorded. Svetlana has a mean time of 12.6 seconds with a standard deviation of 1.25 seconds. Olga records the ten times listed below (in seconds).

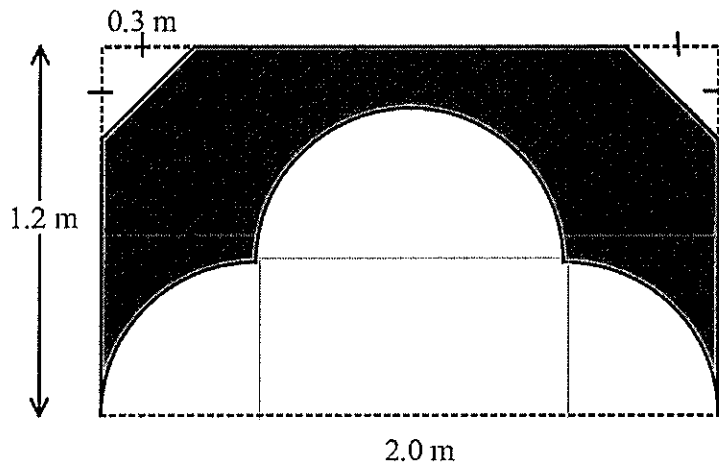
12.5	13.0	11.5	13.0	13.5	11.5	12.0	13.5	11.5	13.0
------	------	------	------	------	------	------	------	------	------

(i) Calculate the mean of Olga's times. 1

(ii) Svetlana ran one more sprint. The mean for her eleven (11) sprints was now the same as Olga's for her first 10 sprints. 1
 What was Svetlana's time on her 11th sprint? 2

Question 22 continues on the next page

- (d) To make an archway, Michelangelo begins with a rectangular sheet of marble. First, he cuts a right isosceles triangle off each of the top two corners. Then he cuts curved sections, starting at the bottom two corners, as shown. Each of the curves are semicircles or quadrants of a circle and all have the same radius.



- (i) Calculate the area of the face of the arch that remains. 2

- (ii) Rounded to the nearest percentage, what percentage of the sheet of marble has been discarded when making the arch. 1

- (e) A garden hose can fill a 5 Litre bucket in 20 seconds. What is the rate of flow from the hose, in Litres per hour? 2

End of Question 22

Examiners' Use Only						
Question	Algebra and Modelling	Data and Statistics	Financial Mathematics	Measurement	Probability	Total
22		a, b, c /7		d, e /5		/12

Student Name

Class

Question 23 (12 marks)

Marks

- (a)** The Body Mass Index (B) is a measure used to evaluate healthy body mass.
The formula for calculating the Body Mass Index is

$$B = \frac{M}{h^2}$$

where M = mass in kilograms and h = height in metres.

- (i)** Calculate the Body Mass Index for Hector, whose height is 1.88 metres and whose mass is 108 kilograms.

1

- (ii)** Hazel has a Body Mass Index of 27.0 and is 1.54 metres in height.
What is Hazel's mass?

2

- (b) (i)** Expand and simplify $2p(3p - 4q) + 3p^2 - 2pq$

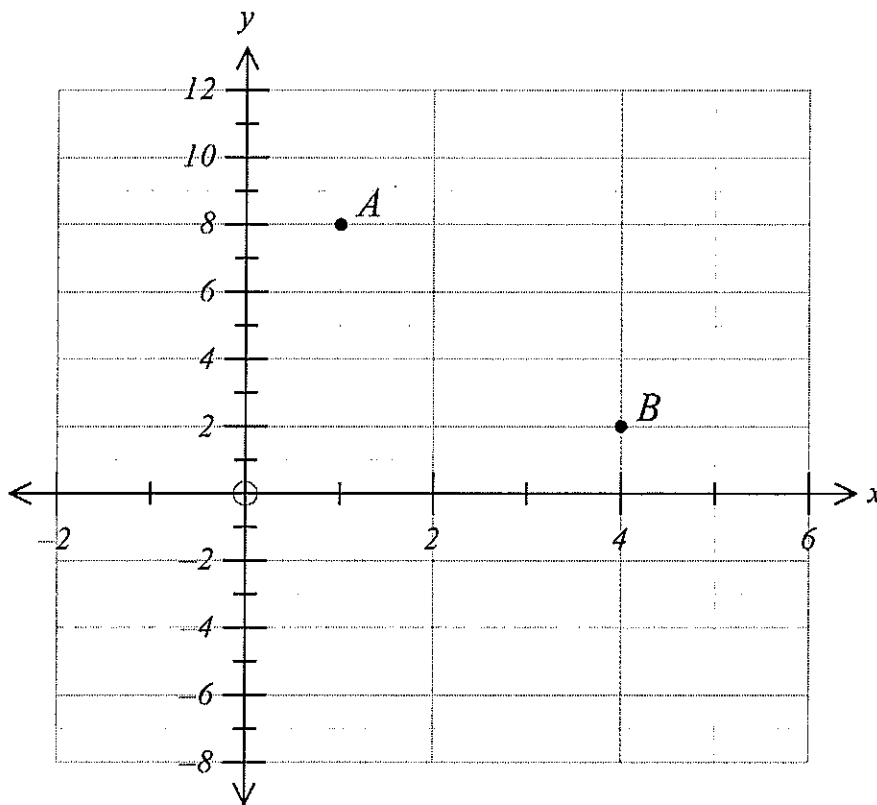
1

- (ii)** Simplify $\frac{9m}{2v} \div \frac{3m}{4}$

1

Question 23 continues on the next page

(c) The points $A(1,8)$ and $B(4,2)$ are shown on the number plane below.



(i) Draw the line $y = 4x - 2$ and write the coordinates of the point of intersection of the lines $y = 4x - 2$ and AB . 2

(ii) Calculate the gradient of the line AB . 1

(iii) Write the equation of the line AB . 2

Question 23 continues on the next page

Question 23 (continued)**Marks**

- (d) (i) Calculate the dividend earned on 900 shares with a face value of \$1.00, if the dividend yield is 6.5%.

1

- (ii) Calculate the amount achieved when 600 shares, valued at \$4.72 each, are sold. The Brokerage Fee is \$32 (fixed).

1

End of Question 23

<i>Examiners' Use Only</i>						
<i>Question</i>	<i>Algebra and Modelling</i>	<i>Data and Statistics</i>	<i>Financial Mathematics</i>	<i>Measurement</i>	<i>Probability</i>	<i>Total</i>
23	<i>a, b, c</i> /10		<i>d</i> /2			/12

Student Name _____

Class _____

Question 24 (15 marks)

Marks

(a) Gladys has the following mobile call plan with the Phoneez company.

Time of day	Calls to other Phoneez mobiles	Calls to all other phones
6:01 am to 12:00 pm	\$0.50 only	\$0.70 plus \$0.75 per minute*
12:01 pm to 6:00 pm	\$0.50 plus \$0.75 per minute*	\$0.90 plus \$1.20 per minute*
6:01 pm to 6:00 am	No charge	\$0.40 plus \$0.45 per minute*

*Costs per minute or part thereof

Two of her friends, Krystal and Lacey, also own Phoneez mobiles and all of Gladys' other calls are to mobiles provided by other companies.

On one day, Gladys makes the following calls:

Time of Call	Recipient of Call	Duration of Call (minutes: seconds)	Cost of Call
8:15 am	Krystal	2:23	\$0.50
12:02 pm	Lacey	3:45	\$3.50
12:45 pm	Tilly	6:30	\$9.30
4:05 pm	Krystal	4:10	\$4.25
3:05 pm	Sally	3:15	\$ 5.70
5:55 pm	Mum	1:08	\$ 3.30
6:10 pm	Sally	9:45	
9:05 pm	Lacey	3:75	

(i) Calculate the cost of the last two calls and determine the total cost of the day's phone calls.

2

(ii) Explain two ways that Gladys could have reduced her total call costs, and still had the same number of calls and the same duration for each call.

2

Question 24 continues on the next page

- (b) Hamlet downloaded the Family History video file shown below, on his internet connection which has a download speed of 500kbps.

Name	Date Modified	Size	Type
Family History.VOB	06/08/2016 6:30 PM	1,048,404 KB	Video file

How long did the download take (in hours and minutes)?

2

- (c) The length and breadth of a rectangle were measured to be 6cm and 4cm, respectively, measured to the nearest centimetre.

(i) Write the upper and lower limits of the true length and breadth.

2

(ii) Calculate the upper and lower limits of its true perimeter.

2

Question 24 continues on the next page

Question 24 (continued)..... Marks

(d) Harvey has the music tracks below on his phone.

Track	Title	Artist	Album
1	Hi I love you	Mischa	Night Time
2	No Sorrow	Mischa	Night Time
3	Behavin	Mischa	Singing Style
4	Nice times	Mischa	Life Soundtrack
5	Crazy Love	The Loops	Loopy
6	Silly Me	The Loops	Loopy
7	Madness	The Loops	Life Soundtrack
8	Bee Be King	K-Zed	Gang Stir
9	Lazin	K-Zed	Life Soundtrack
10	Hello Girl	Gold Fools	Digging for Gold
11	Race of Life	Gold Fools	Life Soundtrack
12	Country Tune	Gold Fools	Digging for Gold

He has the phone playing music tracks and it is set on random selection.

(i) What is the probability that the next track to play will be by Mischa or K-Zed? **1**

(ii) What is the probability that the next track to play will not be from the album, "Life Soundtrack"? **1**

End of Question 24

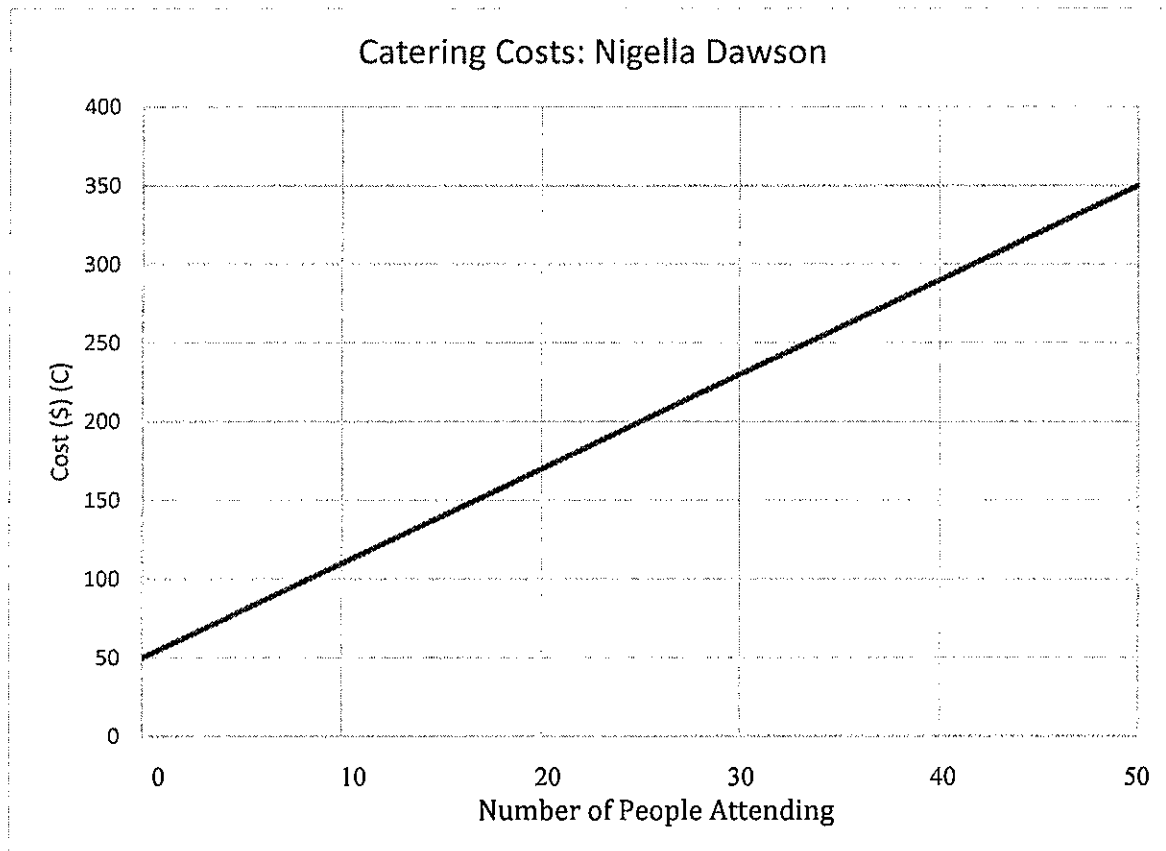
<i>Examiners' Use Only</i>						
Question	Algebra and Modelling	Data and Statistics	Financial Mathematics	Measurement	Probability	Total
24				<i>a, b, c</i> /10	<i>d</i> /2	/12

Student Name _____

Class _____

Question 25 (12 marks)**Marks**

- (a) Nigella Dawson is catering an event.
She has drawn a graph, below, that describes the cost of catering for that event.



- (i) How many people can be catered for with \$300? **1**
-
- (ii) How much will it cost to cater for 22 people? **1**
-
- (iii) What is the "start-up" cost for this event? **1**
-
- (iv) In terms of C (Cost) and N (Number of people), what is the equation of the line in this graph? **2**
-

Question 25 continues on the next page

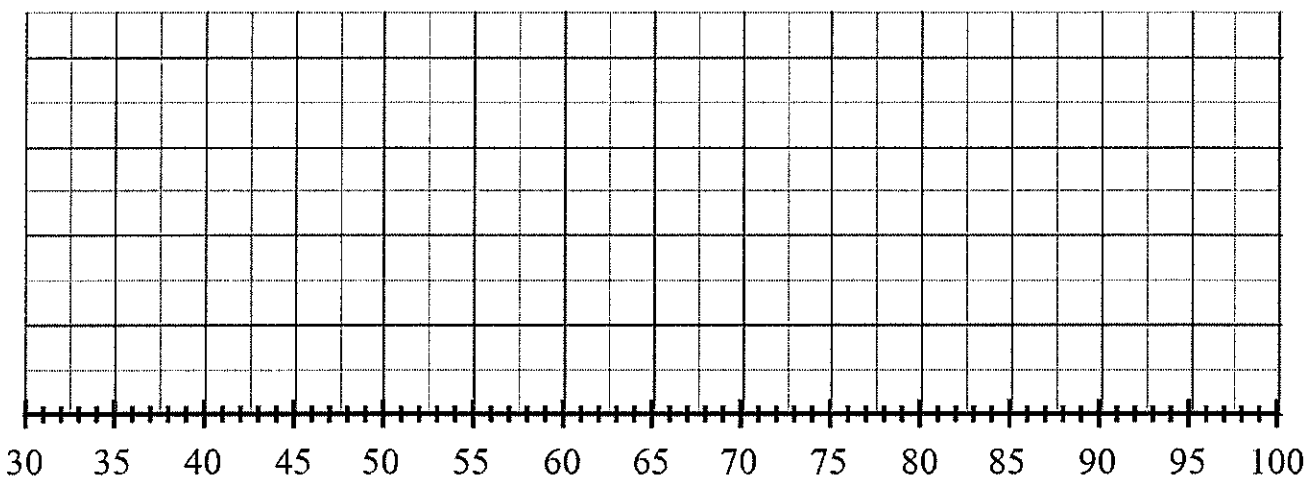
(b) The scores by 30 players on a quiz are shown in the stem and leaf plot below.

3	3	6				
4	2	5	6	7		
5	5	5	7			
6	0	3	5	5	8	8
7	4	4	7	7	7	9
8	0	5	5	8	8	
9	1	5	5	9		

(i) What is the standard deviation of the scores, correct to 1 d.p.? 1

(ii) Write the 5 figure summary for the scores. 2

(iii) Using the scale below, draw a box and whisker plot for the scores. 2



(c) Inflation over five years was 6% p.a. compounding annually.
The cost of a week's groceries, five years ago, was \$180.

How much more would the same week's groceries cost now? 2

End of Question 25.

End of Examination.

<i>Examiners' Use Only</i>						
Question	Algebra and Modelling	Data and Statistics	Financial Mathematics	Measurement	Probability	Total
25	<i>a</i> /5	<i>b</i> /5	<i>c</i> /2			/12

Student Name _____

Class _____

Multiple Choice Answer Sheet

Section I

Total marks (20)

Attempt Questions 1-20

Allow about 25 minutes for this section

Select the alternative A, B, C or D that best answers the question. Fill in the response oval completely.

1	A	B	C	D	
2	A	B	C	D	
3	A	B	C	D	
4	A	B	C	D	
5	A	B	C	D	
6	A	B	C	D	
7	A	B	C	D	
8	A	B	C	D	
9	A	B	C	D	
10	A	B	C	D	

11	A	B	C	D	
12	A	B	C	D	
13	A	B	C	D	
14	A	B	C	D	
15	A	B	C	D	
16	A	B	C	D	
17	A	B	C	D	
18	A	B	C	D	
19	A	B	C	D	
20	A	B	C	D	

Examiners' Use Only						
Question	Algebra and Modelling	Data and Statistics	Financial Mathematics	Measurement	Probability	Total
1-20	13, 14, 15 /3	6, 7, 8 /3	1,2,3, 18, 19, 20 /6	9, 10, 11, 12, 16, 17 /6	4, 5 /2	/20

MASTER

YR 11 GENERAL MATHEMATICS PAT 3

YEAR 11: AUGUST 2016

MULTIPLE CHOICE

1. COST OF 2000 BOOKS = 2000×35
 $= 70,000$

ROYALTIES = $70,000 \times 0.12$
 $= \$8400$ (C)

2. 15% PA FOR 4 YEARS GIVES A FACTOR OF 1.750

VALUE OF INVESTMENT = 2560×1.750
 $= \$4480$ (C)

3. WEEKLY SALARY = $88,000 \div 52$
 $= \$1692.31$

HOLIDAY PAY = $1692.31 \times 4 \times 1.175$
 $= \$7953.85$ (D)

4. RELATIVE FREQUENCIES: JAKE 0.7

ROBBIE 0.9

MICHAEL 0.6

CAMERON 0.7

BEAN 0.5

JAKE + CAMERON ARE EQUALLY LIKELY TO WIN (B)

5. $P(\text{DOES NOT LOSE POINTS}) = P(\text{GAIN}) + P(\text{NEITHER}) = \frac{27+15}{60}$
 $= \frac{42}{60}$
 $= \frac{7}{10}$ (C)

6. $50\% \times 8400 = 4200$ FEMALES

$4200 \times 0.32 = 1344$ FEMALES OF REQUIRED AGE
 $\frac{1344}{8400} \times 100 \times 400 = 64$ (A)

7. 3 3 4 5 7 | 11 11 15 19 21
 Q_0 Q_1 Q_2 Q_3 Q_4

3, 4, 9, 15, 21 (D)

8. THE MEAN WILL NOT CHANGE.

THE ORIGINAL MEDIAN WAS BETWEEN 2 VALUES AND 20 TAKES THE MEDIAN POSITION

THE MODE COULD CHANGE.

THE RANGE WILL NOT CHANGE.

(C)

9. $DBT = 149600000 \times 0.0158$
 $= 2.36 \times 10^6$ (A)

10. CAPACITY = $0.6 \times \left(\frac{1.6+1.2}{2}\right) \times 2.2 \times 1000$
 $= 1848$ LITRES (B)

11) PERIMETER = $20+20+10+20+\sqrt{20^2+10^2}$
 $= 92.36$ (B)

12. AREA = $(15 \times 5) \div 2$
 $= 37.5 \text{ cm}^2$ (A)

13. $3x^2 - 2x(5-4x) + 8x = 3x^2 - 10x + 8x^2 + 8x$
 $= 11x^2 - 2x$ (B)

14. $5x = 7x - 24$
 $-2x = -24$
 $x = 12$ (D)

15. FROM THE GRAPH, IT TAKES AN EXTRA 3 YEARS. (A)

16. PLAN COST \$35

NO EXCESS CALLS

NO EXCESS SMS

$$\text{DATA: } 54.8 \times 30 = 1644 \text{ MB}$$

$$\text{ALLOWANCE: } 1.5 \times 1024$$

$$= 1536 \text{ MB}$$

$$\text{EXCESS: } 1644 - 1536 = 108 \text{ MB}$$

$$\text{COST: } 108 \times 0.65 = \$70.20$$

$$\text{TOTAL COST: } 70.20 + 35.00 = \$105.20 \quad \text{(C)}$$

17. DOWNLOADED: $1024000 + 46080 + 1397760 + 153600$

$$= 2621440 \text{ KB}$$

$$= 2560 \text{ MB}$$

$$= 2.5 \text{ GB}$$

$$\text{CAPACITY (DRIVE)} = 0.5 \times 1024$$

$$= 512 \text{ GB}$$

$$\text{REMAINING: } 512 - 480 - 2.5 = 29.5 \text{ GB} \quad \text{(D)}$$

18. 8 HOURS + (2×1.5) HOURS = 11 HOURS

$$\frac{440}{11} = \$40 / \text{HOUR} \quad \text{(D)}$$

19. ALLOWANCE = $220.40 - ((420 - 400) \times 0.5)$

$$= \$210.40 \quad \text{(B)}$$

20. $A = P(1+r)^n$ $A = 10000$ $r = 0.0075$ $n = 20$

$$10000 = P(1.0075)^{20}$$

$$P = \$8611.90 \quad \text{(B)}$$

QUESTION 21

a i) GROSS PAY = $91000 \div 52$

= 1750

1.

NETT PAY = 1750×0.68

= \$1190

1.

ii) PAY = $(25 \times 35) + (4 \times 25 \times 1.5)$

= \$1025

1.

iii) THE BUDGET DID NOT ACCOUNT FOR HARRY'S TAX.

1.

THE BUDGET THEN DOES NOT WORK!

REDUCE SOME EXPENDITURE BY AT LEAST \$11.25

1.

b i) $A = P(1+r)^n$ $P = 24500$ $r = 0.12$ $n = 2.5$ YRS

= $24500(1.12)^{2.5}$

= \$32524.54

ii) $A = P(1+r)^n$ $P = 24500$ $r = 0.01$ $n = 30$

= $24500(1.01)^{30}$

= \$33022.30

EXTRA INTEREST: $33022.30 -$

32524.54

497.76

1.

c i) $P(\text{WHITE COUNTER}) = \frac{1}{6}$

1.

ii) $P(\text{COUNTER}) = \frac{5}{18}$

1.

d i) $P(\text{LESS THAN 5}) = \frac{1}{3}$

1.

ii) $P(5, 7, 10) = \frac{3}{4}$

1.

$$\begin{aligned} \text{ii) JEWELLERY ARRANGEMENTS} &= 10 \times 4 \times 8 \\ &= 320 \end{aligned}$$

1.

$$\text{ii) PLAIN SILVER} = 2 \times 1 + 3 = 6$$

$$\text{PLAIN GOLD} = 3 \times 1 \times 1 = 3$$

$$\text{TOTAL} = 6 + 3$$

$$= 9$$

1.

QUESTION 22

a) i) WORDED DESCRIPTIONS: CATEGORICAL

DECREASING ORDER OF FITNESS: ORDINAL

\therefore ORDINAL CATEGORICAL

1.

ii) NUMBER OF SIBLINGS: QUANTITATIVE

WHOLE NUMBERS: DISCRETE

\therefore DISCRETE QUANTITATIVE

1.

b) i) 4 IS THE LOWER EXTREME

27 IS THE UPPER QUANTILE

\therefore 75% OF TRUCKS ARE IN THIS RANGE.

1.

ii) IQR = 27 - 7

= 20

1.

c) i) OLGA'S MEAN = 12.5 (FROM CALCULATOR)

1.

ii) SVETLANA'S NEW MEAN = 12.5 = $\frac{126 + x}{11}$

1.

$$x = (12.5 \times 11) - 126$$

$$= 11.5$$

SVETLANA'S 11TH SPRINT WAS 11.5 SECONDS.

1.

d) i) TOTAL AREA = 1.2 × 2

$$= 2.4 \text{ m}^2$$

AREA (CORNERS) = 0.3 × 0.3

$$= 0.09$$

AREA (CIRCLES) = $\pi \times 0.5^2$

$$= 0.79$$

AREA (RECTANGLE) = 0.5 × 1

$$= 0.5$$

$$\text{AREA (ARCH)} = 2.4 - (0.09 + 0.79 +$$

$$0.5) \quad 1.$$

$$= 1.024$$

$$= 1.02 \text{ m}^2 \quad 1.$$

$$\text{ii) WASTAGE} = \frac{2.4 - 1.02}{2.4} \times 100$$
$$= 58\%$$

l.

c) RATE : 5 LITRES IN 20 SECONDS

$$\therefore 20 \times 3 \times 60 = 1 \text{ HR}$$

l.

$$\therefore 5 \times 3 \times 60 = 900$$

$$\therefore \text{RATE} = 900 \text{ L/HR}$$

l.

QUESTION 23

a) $B = \frac{108}{1.88^2}$
 $= 30.56$

1.

ii) $27 = \frac{x}{1.54^2}$
 $x = 64.03 \text{ kg (mass)}$

1.

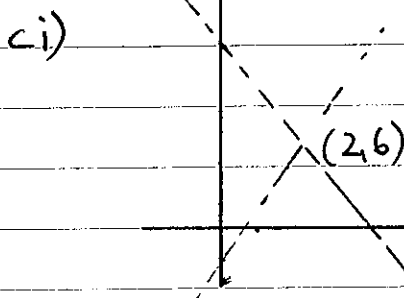
1.

b) $2p(3p-4q) + 3p^2 - 2pq = 6p^2 - 8pq + 3p^2 - 2pq$
 $= 9p^2 - 10pq$

1.

ii) $\frac{9m}{2v} \div \frac{3m}{4} = \frac{9m}{2v} \times \frac{4}{3m}$
 $= \frac{6}{v}$

1.



PLOTTED LINE 1.

POINT OF INTERSECTION 1.

ii) GRADIENT = $\frac{-6}{3}$
 $= -2$

1.

iii) $AB = 10$ (y INTERCEPT)

1. GRADIENT

$\therefore y = -2x + 10$

1. y-INTERCEPT

d) DIVIDEND YIELD = $900 \times 1 \times 6.5\%$
 $= \$58.50$

1.

ii) $(600 \times 4.72) - 32 = \2800

1.

QUESTION 24

$$\begin{aligned} \text{a) i) SALLY} &= (10 \times 0.40) + 0.45 \\ &= \$4.90 \end{aligned} \quad 1.$$

$$\text{LACEY} = 0$$

$$\begin{aligned} \text{TOTAL FOR DAY} &= 0.5 + 3.50 + 9.30 + 4.25 + 5.70 + 3.30 + 4.90 \\ &= \$31.45 \end{aligned}$$

ii) CONSIDER THE TIME OF CALLING 1.
CONSIDER IS CALLED 1.

$$\begin{aligned} \text{b) } 500 \text{ Kbps} &= 500,000 \text{ BITS/SECOND} \\ 1048404 \text{ KB} &= 1048404 \times 1024 \text{ BYTES} \\ &= 1073565696 \text{ BYTES} \\ &= 1073565696 \times 8 \text{ BITS} \\ &= 8588525568 \text{ BITS} \quad 1. \\ \text{TIME} &= \frac{8588525568}{500,000} \\ &= 17177.051136 \\ &= 4 \text{ HRS } 46 \text{ MINS} \quad 1. \end{aligned}$$

$$\begin{aligned} \text{c) i) LENGTH} &: 5.5 \text{ cm to } 6.5 \text{ cm} \quad 1. \\ \text{WIDTH} &: 3.5 \text{ cm to } 4.5 \text{ cm} \quad 1. \end{aligned}$$

$$\begin{aligned} \text{ii) PERIMETER (LOWER LIMIT)} &= 5.5 + 5.5 + 3.5 + 3.5 \\ &= 18 \text{ cm} \quad 1. \end{aligned}$$

$$\begin{aligned} \text{PERIMETER (UPPER LIMIT)} &= 6.5 + 6.5 + 4.5 + 4.5 \\ &= 22 \text{ cm} \quad 1. \end{aligned}$$

$$\text{d) i) } P(\text{MISCHA OR K-2ED}) = \frac{1}{2} \quad 1.$$

$$\text{ii) } P'(\text{LIFE SOUNDTRACK}) = \frac{2}{3} \quad 1.$$

QUESTION 25

a) 42 PEOPLE

1.

ii) \$180

1.

iii) 550

1.

iv) $C = 6N + 50$

1. GRADIENT

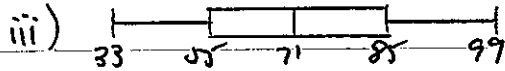
1. y-INTERCEPT

b) 18-1

1.

ii) 33, 55, 71, 85, 99.

2.



1. ACCURACY

1. NEATNESS

$$\begin{aligned} \text{c) } FV &= 180 (1 + 0.06)^5 \\ &= \$240.88 \end{aligned}$$

1.

$$\text{INCREASE IN VALUE} = 240.88 -$$

$$\underline{180.00}$$

$$\$60.88$$

1.