Student's name **Student's number** **Teacher's name**

_____ _____ _____

PRESBYTERIAN LADIES' COLLEGE SYDNEY 1888

2011

TRIAL
HIGHER SCHOOL CERTIFICATE
EXAMINATION

General Mathematics

General Instructions

- Reading time: 5 minutes
- Working time: $2\frac{1}{2}$ hours
- Write using blue or black pen
- Calculators may be used
- A formula sheet is provided at the back of this paper

Total Marks – 100

Section I: Pages 2-8
22 marks

- Attempt questions 1-22, using the answer sheet on page 21.
- Allow about 30 minutes for this section

Section II: Pages 9-18
78 marks

- Attempt questions 23-28, using all 6 writing booklets provided
- Allow about 2 hours for this section

Multiple Choice	23	24	25	26	27	28	Total
							%

Section I

22 marks

Attempt Questions 1-22

Allow about 30 minutes for this section

1. Simplify $2k^3 \div 8k^2$

(A) $\frac{k}{4}$

(B) $\frac{4}{k}$

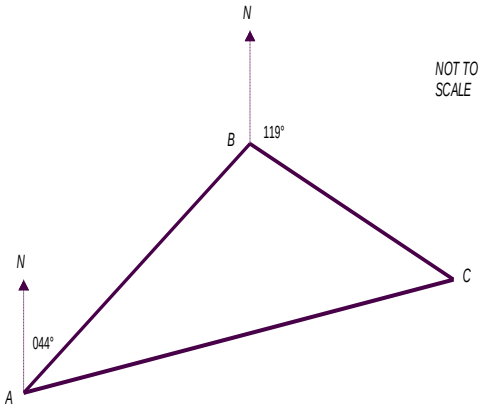
(C) $\frac{1}{4k}$

(D) $4k$

2. A survey is conducted to determine the most common colour of cars in Croydon. Which best describes the type of data to be collected?

(A) Biased
(B) Categorical
(C) Continuous
(D) Discrete

3. What is the size of $\angle ABC$?



(A) 17°
(B) 61°
(C) 105°
(D) 163°

4. An unbiased coin is to be tossed 3 times. On each of the first 2 tosses the result is a head. What is the probability that the coin will land on heads on the third toss?

(A) $\frac{1}{8}$

(B) $\frac{1}{6}$

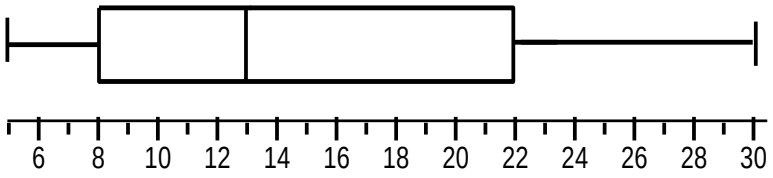
(C) $\frac{1}{3}$

(D) $\frac{1}{2}$

5. Lauren invests $10 000 at 5% per annum, compounded monthly. What is the value of the investment after 2 years, to the nearest dollar?

(A) $10 084
(B) $10 500
(C) $11 025
(D) $11 049

6. The results of a survey are displayed in a box-and-whisker plot.



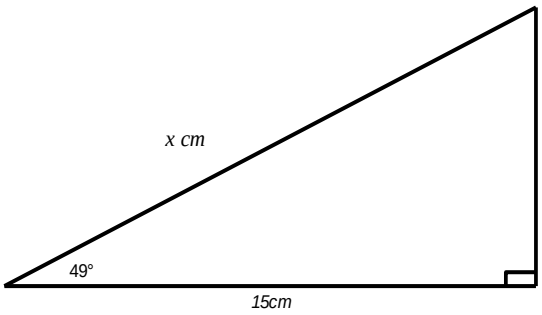
What is the interquartile range of this data?

(A) 5
(B) 9
(C) 14
(D) 25

7. From a pack of ten cards, numbered from 1 to 10, a card is selected at random. What best describes the chance of selecting an even numbered card?

(A) Equally likely
(B) Unlikely
(C) Impossible
(D) Certain

8. What is the value of *x*, correct to 2 decimal places?



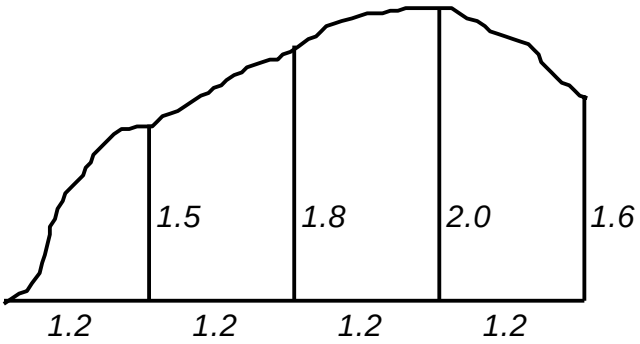
NOT TO SCALE

(A) 9.84 *cm*
(B) 13.04 *cm*
(C) 19.88 *cm*
(D) 22.86 *cm*

9. Chicago is located approximately at $(42^\circ N, 87^\circ W)$. Tegucigalpa is due south of Chicago. Which of the following could be the co-ordinates of Tegucigalpa?

(A) $(14^\circ N,\ 87^\circ W)$
(B) $(42^\circ N, 63^\circ W)$
(C) $(49^\circ N,\ 87^\circ W)$
(D) $(42^\circ N, 131^\circ W)$

10. A pond is to be constructed on the sunken lawn. Its surface area is shown below with all measurements in metres.



NOT TO SCALE

The depth of the pond is to be 30*cm*. What is the volume of this pond, correct to 2 decimal places?

(A) $2.20\,m^3$
(B) $2.21\,m^3$
(C) $2.30\,m^3$
(D) $3.40\,m^3$

11. The volume of a cone can be found using the formula $V = \frac{1}{3}\pi r^2 h$ where r = radius and h = perpendicular height of the cone.
If the formula is re-arranged to make r the subject, which is the equivalent correct formula?

(A) $r = \sqrt{\frac{V}{3\pi h}}$

(B) $r = \sqrt{\frac{3V}{\pi h}}$

(C) $r = h\sqrt{\frac{V\pi}{3}}$

(D) $r = h\sqrt{\frac{3V}{\pi}}$

12. One atom of oxygen has a mass of $2.657807 \times 10^{-23} g$. How many atoms of oxygen in $1g$? Answer in scientific notation correct to 3 significant figures.

(A) 3.76×10^{-24}
(B) 3.763×10^{-24}
(C) 3.76×10^{22}
(D) 3.763×10^{22}

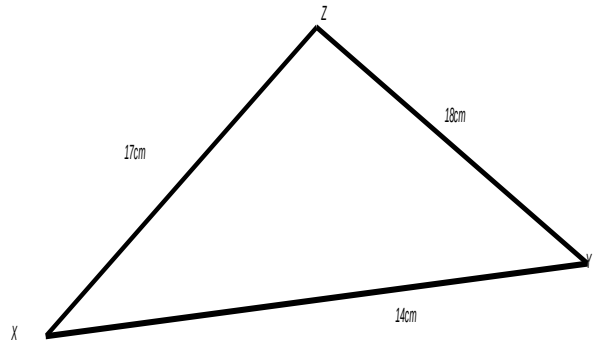
13. How many different ways are there of answering a four question TRUE/FALSE test?

(A) 2
(B) 4
(C) 8
(D) 16

14. If the interest on an investment is quoted at 7% per annum, what amount needs to be invested in order for the investment to be worth $604.55 at the end of 1 year?

(A) $42.32
(B) $86.36
(C) $565.00
(D) $646.87

15. What is the value of $\angle XZY$ in this diagram?
Answer to the nearest degree.



NOT TO SCALE

(A) 43°
(B) 47°
(C) 63°
(D) 70°

16. For adults, the Body-Mass Index is given by $B = \frac{m}{h^2}$ where

m= mass in kilograms and
h= height in metres.
The medically accepted healthy range for B is from 21 to 25 inclusive.

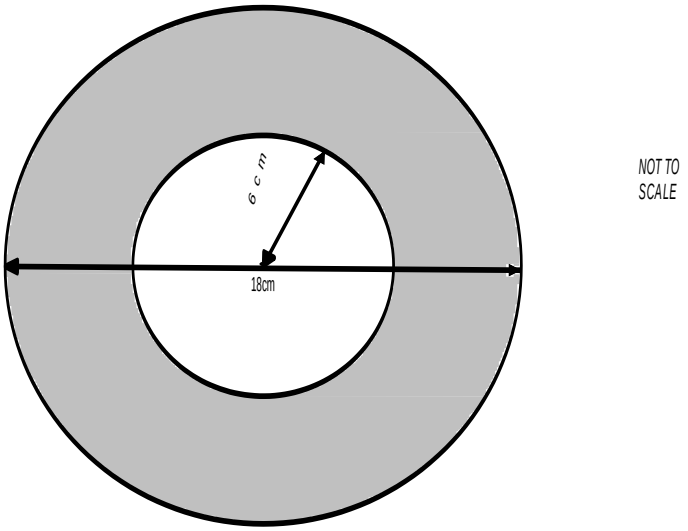
Keith is 171cm tall. What is his maximum mass if his Body-Mass Index is to be within the accepted healthy range? Answer to the nearest kilogram.

(A) 69 kg
(B) 73 kg
(C) 75 kg
(D) 82 kg

17. Melman, the giraffe, can run at 51.5km/h. What is this speed in m/s?
Write your answer correct to 1 decimal place.

(A) 14.3
(B) 35.8
(C) 69.9
(D) 85.8

18. What is the area of the annulus (shaded section) below, correct to 1 decimal place?



(A) $28.3\,cm^2$

(B) $141.4\,cm^2$

(C) $452.4\,cm^2$

(D) $904.8\,cm^2$

19. Using the table of *Future Values of $1,* what is the value of an ordinary annuity of $700 per month which is invested at 4% per month for 5 months?

	Future Value of $1				
	Interest Rates				
Period	**4%**	**5%**	**6%**	**7%**	**8%**
1	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0400	2.0500	2.0600	2.0700	2.0800
3	3.1216	3.1525	3.1836	3.2149	3.2464
4	4.2465	4.3101	4.3746	4.4400	4.5061
5	5.4163	5.5256	5.6371	5.7507	5.8666

(A) $4.31

(B) $5.42

(C) $3 017.07

(D) $3 791.41

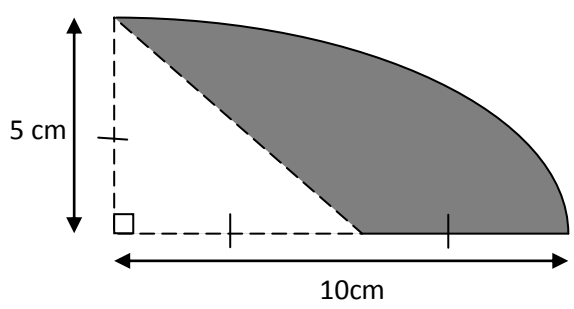
20. Maria's photocopier reduces images by 20%. How many times must you photocopy the previous image to reduce the original size to less than 5%?

(A) 4
(B) 5
(C) 10
(D) 14

21. Trish is buying a new SMART car. Its cash price is $21 990. She is considering buying the car on terms of 25% deposit and 48 monthly payments. If bought on these terms the total cost of the car would be $28 894.92. How much would the monthly payments be under these terms?

(A) $451.48
(B) $458.13
(C) $487.45
(D) $601.08

22. The diagram shows a quarter of an ellipse with an isosceles triangle cut out of it. What is the area of the shaded shape?



NOT TO SCALE

(A) $\frac{25\pi - 25}{2}\ cm^2$
(B) $50\pi - 12.5\ cm^2$
(C) $50\pi - 25\ cm^2$
(D) $200\pi - 12.5\ cm^2$

End of Section I

Section II

78 marks

Attempt Questions 23-28

Allow about 2 hours for this section

Question 23 (13 marks) **Marks**

a) Expand and simplify $2x^2(6-x)+x(x-2)$. **2**

b) Dr Burgis surveys a Year 12 General Mathematics class to find out how much they use the school cafeteria. Could he assume that the data from this survey would be representative of the whole school population? Justify/explain your answer. **1**

c) Into a large bowl of mini easter eggs, a packet of 50 caramel eggs is tipped in and mixed around. **2**
A random selection of 20 eggs is selected from the bowl and 4 were found to be caramel.
Calculate the estimate for the total number of all eggs in the bowl.

d) Chris earns a taxable income of $63 084.

(i) Use the table below to calculate the total tax payable on his income. **3**

Taxable Income	*Tax Payable*
$0-$6000	NIL
$6 001-$22 000	18cents for each $1 over $6 000
$22 001-$55 000	$2 880 plus 30 cents for each $1 over $22 000
$55 001-$66 000	$12 780 plus 45 cents for each $1 over $55 000
$66 001 and over	$17 730 plus 48 cents for each $1 over $66 000

(ii) Calculate Chris's net monthly income. **2**

(iii) Chris contributes $200 each month to a superannuation plan. If his investment earns 0.5% per month, compounded monthly, how much will his superannuation fund be worth after 10 years? **2**

(iv) What percentage of his net income does Chris invest each month? Answer to the nearest percent. **1**

End of Question 23

Question 24 (13 marks) **Marks**

a) A survey was conducted to determine if people belonged to a gym and if they followed a good diet. The results are displayed in the following two-way table.

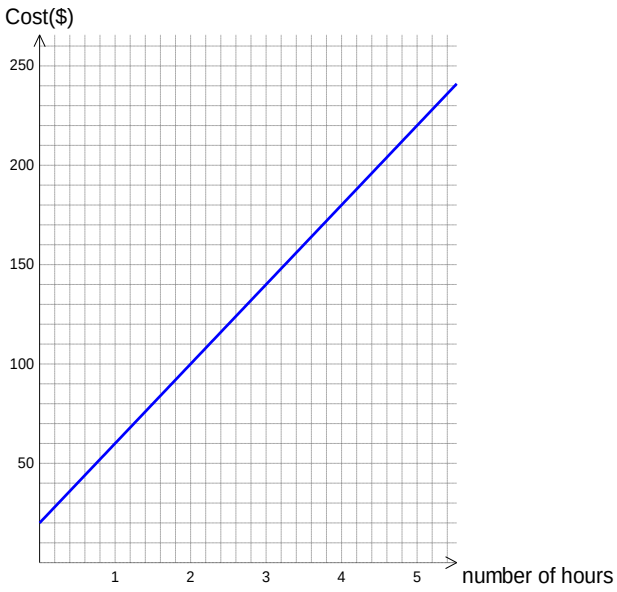
	Good Diet	Poor Diet
Gym member	105	34
Non-Gym member	43	58

(i) How many people were surveyed? **1**

(ii) From the group surveyed, one of these people is selected at random. What is the probability that they are a gym member with a good diet? **1**

(iii) From the group surveyed, one of these people is selected at random. What is the probability that they have a poor diet? **1**

b) The graph below represents the cost of hiring Dave, the gardener.



(i) How much does it cost for Dave to do 2 hours work? **1**

(ii) How long did Dave work if he charges the customer $200? **1**

(iii) Find the gradient of this line. What information does this give about Dave? **2**

(iv) Find the y-intercept. What does this value represent? **2**

(v) If Dave were to increase his hourly rate, what would remain the same and what would change in the graph? **2**

Question 24 continues next page

c) Vancouver is located at $(49^\circ N, 123^\circ W)$. San Francisco is located at $(38^\circ N, 123^\circ W)$.

Find the distance between these two cities. Give your answer to the nearest kilometre. **2**

1*nautical mile* = 1.852*km*

End of Question 24

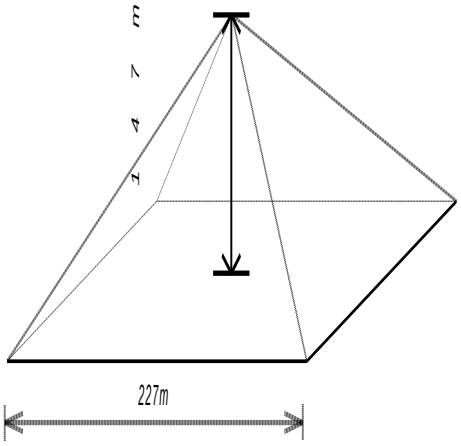
Question 25 (13 marks) **Marks**

a) Myles is visiting Seattle which is located at approximately $(48^\circ N, 122^\circ W)$. I am in Sydney which is located at approximately $(34^\circ S, 151^\circ E)$.

(i) Calculate the time difference between Seattle and Sydney. Answer in hours and minutes. **2**

(ii) If it is 12 midday on 10 August in Sydney when I phone Myles, what time and day will it be in Seattle? **2**

b)



The Great Pyramid of Giza was built with a square base of side length 227m and perpendicular height of 147m.

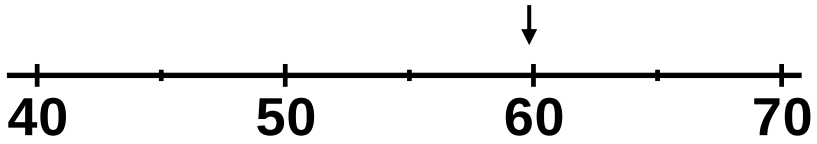
(i) It is estimated that 2.3×10^6 blocks had been used to build the great pyramid, making a total mass for the blocks of 5.75×10^6 tonnes. Calculate the average mass of each block. **1**

(ii) Calculate the surface area of the pyramid, correct to 1 decimal place. Do not include the base of the pyramid. **3**

(iii) If the dimensions of the pyramid were doubled, what would happen to the surface area of the new pyramid, compared to the existing one? Use mathematics to support your answer. **2**

Question 25 continues next page

c) A section of the speedometer on my car is shown below.



My speed is measured at *60km/h*.

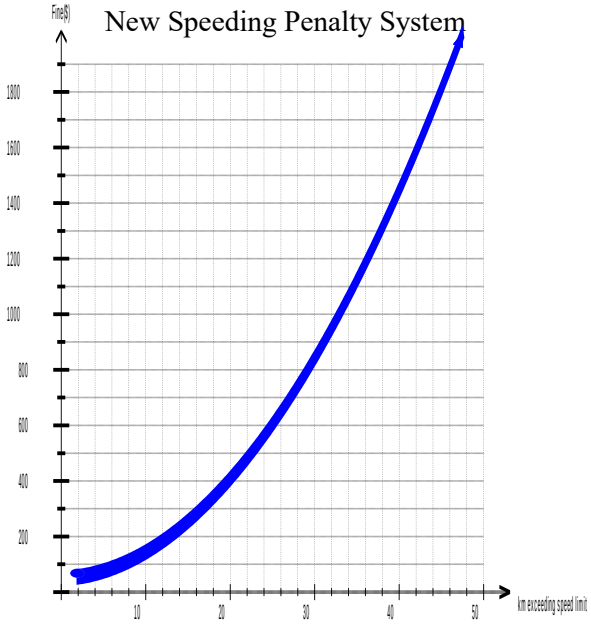
(i) Calculate the error for this measurement. **2**

(ii) Speed cameras are set *3km/h* above the speed limit. By considering the accuracy of my speedometer, give a reason supporting this *3km/h* margin. **1**

End of Question 25

Question 26 (13 marks) **Marks**

a) A new speeding penalty system is being considered. A graph representing this new system is shown below and a bigger version is on page 23.



By using the graph on page 23 estimate each of the following:

(i) What is the minimum speeding fine you can receive? **1**

(ii) How much would the fine be if you were caught driving 30km over the speed limit? **1**

(iii) How fast would you be going if you received a fine of $700? **1**

Question 26 continues next page

(iv) On the graph provided on page 23, graph the information given in the table below about the current system and the fines. **3**

Exceed speed	***Demerit points***	***Fine***
Not more than 10km/h	1	$90
More than 10km/h but not more than 20km/h	3	$211
More than 20km/h but not more than 30km/h	4	$361
More than 30km/h but not more than 45km/h	5	$692
More than 45km/h	6	$1865

(v) At what speed(s) would both systems result in the same fine? **2**

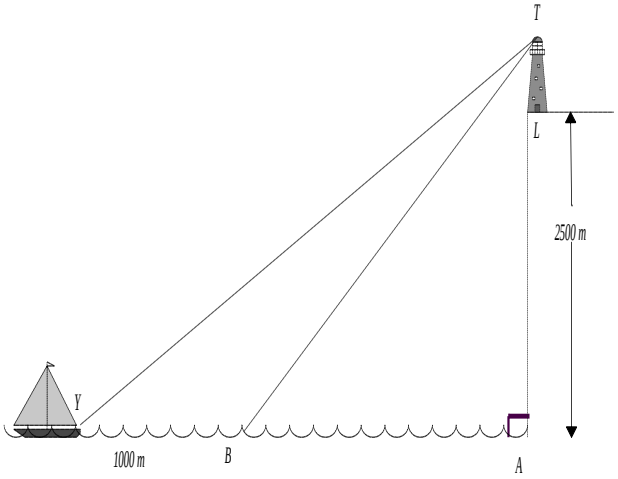
(vi) Assuming you want to minimise the fine paid, which system would you recommend and why? **2**

b) I am setting up a fund for my son's university expenses. He needs to withdraw $2000 per month for four years. If I can invest my money at 9% p.a., compounding monthly, what single investment must I make to cover his expenses? **3**

End of Question 26

Question 27 (13 marks) **Marks**

a) The angle of elevation of the top of the lighthouse, T, from a buoy, *B*, is $32°$. From a yacht, *Y*, 1000 *m* further away from the lighthouse than the buoy, *B*, the angle of elevation is $27°$.



NOT TO SCALE

(i) Show that $\angle YTB = 5°$ **1**

(ii) Find the length of *TB*. Write your answer to the nearest metre. **3**

(iii) Hence, or otherwise, find the height of the lighthouse, *TL* correct to 1 decimal place. **2**

b) The following marks were scored by students in their Trial HSC General Mathematics examination.

MARKS	FREQUENCY
67	1
70	3
71	2
74	1
78	3
83	5
85	3
89	2
90	5
92	1
95	2

(i) Find the mean and standard deviation of the scores. Answer to 2 decimal places. **2**

(ii) Draw a stem-and-leaf plot to represent this data. **2**

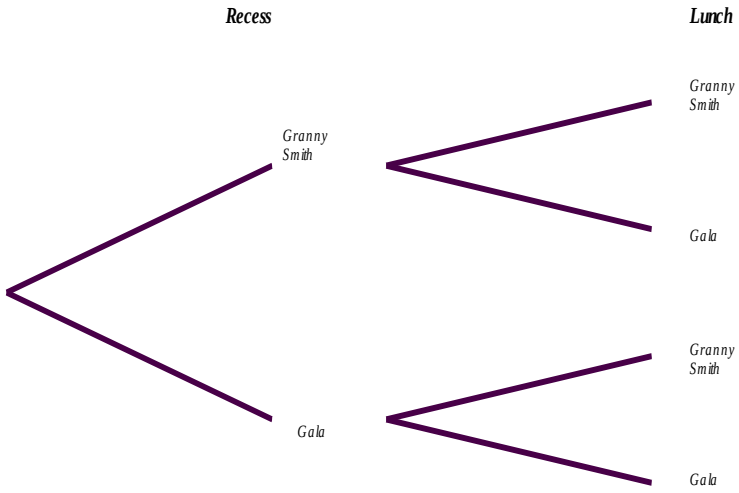
(iii) Find the mode, median and range. **3**

End of Question 27

Question 28 (13 marks) **Marks**

a) In a large fruit bowl, there are 8 Granny Smith (green) apples and 7 Gala (red) apples. I choose one apple at random for recess, followed by a random selection of another for lunch.

(i) Copy the tree diagram into your writing booklet. **2**
Complete your tree diagram by writing the correct probability on each branch.



(ii) Find the values of ***A***, ***B*** and ***C*** in the table below. **2**

Type of Apple	***Probability***
Both Granny Smith	***A***
One Granny Smith and one Gala	***B***
Both Gala	***C***

(iii) I play a game with my friend which depends on the outcome of the selection of the apples as follows:

Type of Apple	***Probability***	***Result***
Both Granny Smith	***A***	Win \$2
One Granny Smith and one Gala	***B***	Lose \$1.50
Both Gala	***C***	Win \$2

What is the financial expectation of the game? **2**

(iv) My mother comes home and places 3 more Granny Smith and 2 more Gala apples into the bowl after I have chosen my first apple for recess. Calculate the probability of selecting the same variety of apple for recess and lunch. **2**

Question 28 continues next page

b) Grant would like to purchase a car at the end of his university course in 4 years time. His target is to have $18 000. He invests his savings at 6% p.a. with interest compounding monthly.

(i) How much does he need to invest each month in order to reach his goal of $18000? **3**

Grant buys the car valued at $18000. It depreciates at a rate of 12.5% p.a.

(ii) Find the salvage value of the car at the end of 3 years, using the declining balance method. **2**

End of Paper

General Mathematics Formulae Sheet (page 1 of 2)

Area of an annulus

$A = \pi\left(R^2 - r^2\right)$

$R =$ radius of outer circle
$r =$ radius of inner circle

Area of an ellipse

$A = \pi ab$

$a =$ length of semi-major axis
$b =$ length of semi-minor axis

Area of a sector

$A = \dfrac{\theta}{360}\pi r^2$

$\theta =$ number of degrees in central angle

Arc length of a circle

$l = \dfrac{\theta}{360}2\pi r$

$\theta =$ number of degrees in central angle

Simpson's rule for area approximation

$A \approx \dfrac{h}{3}\left(d_f + 4d_m + d_l\right)$

$h =$ distance between successive measurements
$d_f =$ first measurement
$d_m =$ middle measurement
$d_l =$ last measurement

Surface area

Sphere $A = 4\pi r^2$
Closed cylinder $A = 2\pi rh + 2\pi r^2$

$r =$ radius
$h =$ perpendicular height

Volume

Cone $V = \dfrac{1}{3}\pi r^2 h$

Cylinder $V = \pi r^2 h$

Pyramid $V = \dfrac{1}{3}Ah$

Sphere $V = \dfrac{4}{3}\pi r^3$

$r =$ radius
$h =$ perpendicular height
$A =$ area of base

Sine rule

$\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

Area of a triangle

$A = \dfrac{1}{2}ab\sin C$

Cosine rule

$c^2 = a^2 + b^2 - 2ab\cos C$

or

$\cos C = \dfrac{a^2 + b^2 - c^2}{2ab}$

General Mathematics Formulae Sheet (page 2 of 2)

Simple interest

$I = Prn$

$P =$ initial quantity
$r =$ percentage interest per period, expressed as a decimal
$n =$ number of periods

Compound interest

$A = P(1+r)^n$

$A =$ final balance
$P =$ initial quantity
$n =$ number of compounding periods
$r =$ percentage interest per compounding period, expressed as a decimal

Future value (A) of an annuity

$$A = M\left\{\frac{(1+r)^n - 1}{r}\right\}$$

$M =$ contribution per period, paid at the end of the period

Present value (N) of an annuity

$$N = M\left\{\frac{(1+r)^n - 1}{r(1+r)^n}\right\}$$

or

$$N = \frac{A}{(1+r)^n}$$

Straight-line formula for depreciation

$S = V_0 - Dn$

$S =$ salvage value of asset after n periods
$V_0 =$ purchase price of the asset
$D =$ amount of depreciation apportioned per period
$n =$ number of periods

Declining balance formula for depreciation

$S = V_0(1-r)^n$

$S =$ salvage value of asset after n periods
$r =$ percentage interest rate per period, expressed as a decimal

Mean of a sample

$$\bar{x} = \frac{\sum x}{n}$$

$$\bar{x} = \frac{\sum fx}{\sum f}$$

$\bar{x} =$ mean
$x =$ individual score
$n =$ number of scores
$f =$ frequency

Formula for a z - score

$$z = \frac{x - \bar{x}}{s}$$

$s =$ standard deviation

Gradient of a straight line

$$m = \frac{\text{vertical change in position}}{\text{horizontal change in position}}$$

Gradient-intercept form of a straight line

$y = mx + b$

$m =$ gradient
$b = y$-intercept

Probability of an event

The probability of an event where outcomes are equally likely is given by:

$$P(\text{event}) = \frac{\text{number of favourable outcomes}}{\text{total number of outcomes}}$$

General Mathematics: Multiple Choice Answer Sheet

Student Number_____

Completely fill the response oval representing the most correct answer.

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 ⬭
21. A ⬭ B ⬭ C ⬭ D ⬭
22. A ⬭ B ⬭ C ⬭ D ⬭

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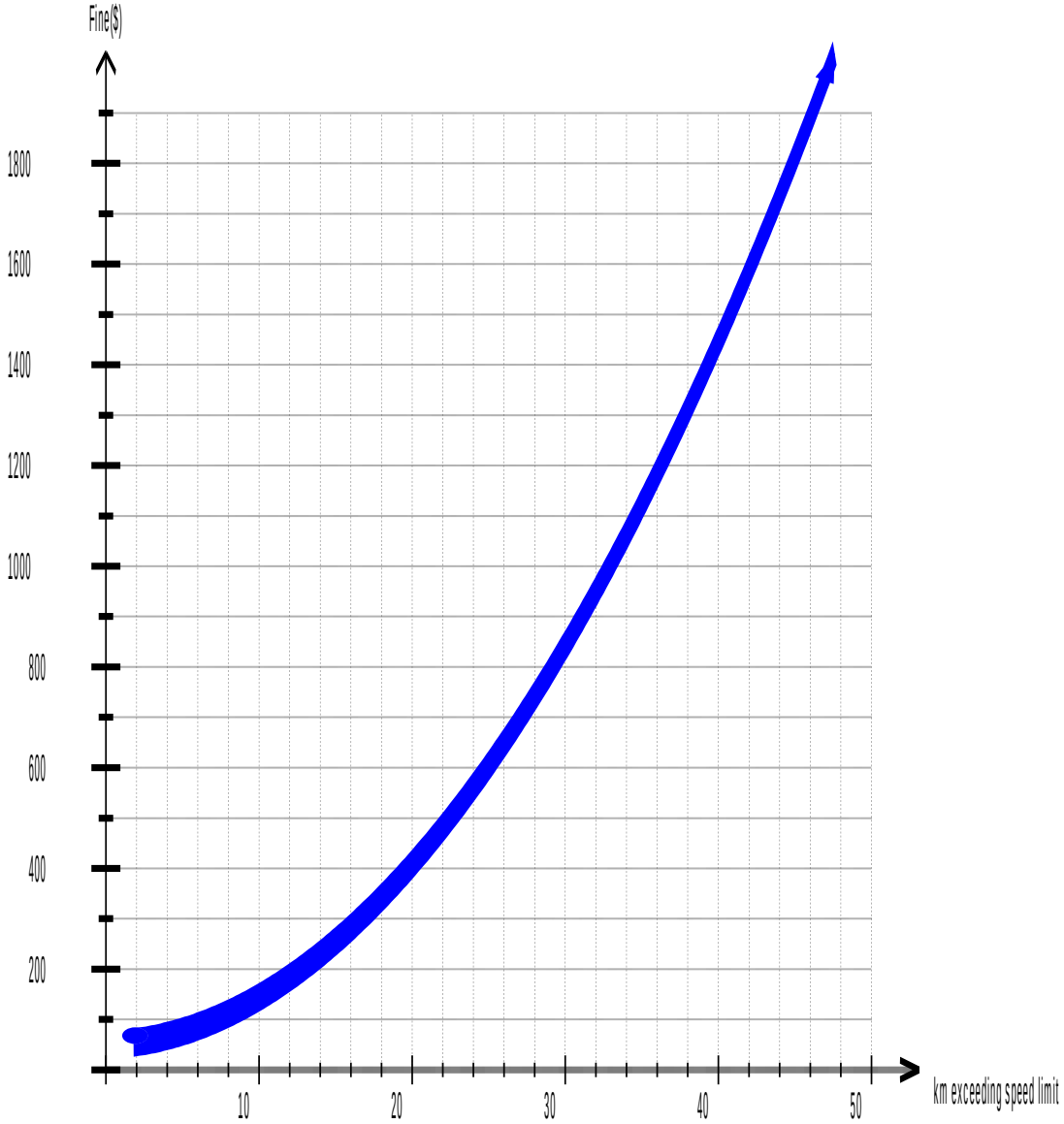
Question 26 a)

Student Number.....

Detach this page, complete the graph of the information in the table and attach it to your answers for Question 26a).



PLC Sydney 2011 Trial General Maths

General Mathematics: Multiple Choice Answer Sheet

Student Number ANSWERS

Completely fill the response oval representing the most correct answer.

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 ●
21.	A ○	B ○	C ●	D ○
22.	A ●	B ○	C ○	D ○

Academic Year	Yr 12	Calendar Year	2011
Course	General	Name of task/exam	Trial

Question 23:

a) $2x^2(6-x)+x(x-2)$

$= 12x^2 - 2x^3 + x^2 - 2x$

$= 13x^2 - 2x^3 - 2x$

b) No, it would not be representative of the whole school because Yr 12 can go to Croydon shops to buy food, other year groups cannot.

c) $\frac{4}{20} = \frac{50}{x}$

$4x = 1000$

$x = 250$

∴ total number of eggs $\div 250$

d) i Tax $= 12\,780 + 0.45(63\,084 - 55000)$

$= 16\,417.80$

ii $\frac{63\,084 - 16\,417.80}{12} = \$3\,888.85$

iii $A = M\left\{\frac{(1+r)^n - 1}{r}\right\}$

$= 200\left\{\frac{(1+0.5\%)^{120} - 1}{0.5\%}\right\}$

$= \$32\,775.87$

iv $\frac{200}{3\,888.85} \times 100\%$

$= 5\%$ (nrst percent)

Question 24:

a) i 240

ii $\frac{105}{240} = \frac{7}{16}$

iii $\frac{92}{240} = \frac{23}{60}$

b) i \$100

ii $4\frac{1}{2}$ hours

iii gradient $= \frac{\text{rise}}{\text{run}}$

$= \frac{80}{2}$

$= 40$

\$40/h is Dave's hourly rate

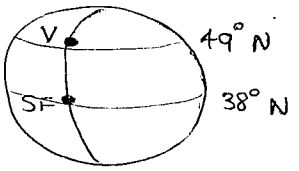
iv \$20 The call out fee

v The call out fee would remain the same (i.e. y-intercept)

The rate increasing means the line would be steeper

Academic Year		Calendar Year	
Course		Name of task/exam	

c)



$11° \times 60 = 660$ M

$660 \times 1.852 = 1222.32$ km

$= 1222$ km

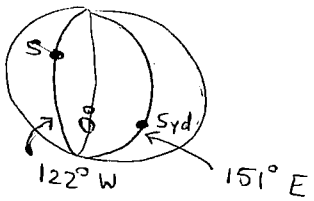
OR $\frac{11}{360} \times 2\pi \times 6400 = 1228.71$ km

$= 1229$ km

(given radius earth = 6400 km).

Question 25:

a) i



Angle diff $= 122 + 151$

$= 273°$

$1° = 4$ mins OR $273° \div 15$

$273° = 4 \times 273$ $= 18$h 12 mins

$= 1092$ mins

$= \frac{1092}{60}$ h

$= 18.2$ h or 18 h 12 mins

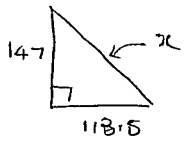
ii 12 midday 10th Aug

12 midday − 18 h 12 mins

= 5:48 pm Aug 9th

b) i $\frac{5.75 \times 10^6}{2.3 \times 10^6} = 2.5$ tonnes / block

ii



$x^2 = 147^2 + 113.5^2$

$x = 185.718...$

$S.A = 4 \times \frac{1}{2} \times 227 \times 185.718...$

$= 84316.06... \text{ m}^2$

$= 84316.1 \text{ m}^2$ (1 dp)

iii $S.A = 4 \times \frac{1}{2} \times 454 \times 371.436...$

$= 337264.25...$,

$\frac{337264.25...}{84316.06...} \div 4$

new pyramid 4 times bigger in S.A. if dimensions are doubled.

c) i error $= \pm 2.5$ km/h

ii since the error would allow the speed to be up to 62.5 km/h, having the speed camera set 3 km/h above the speed limit you would be certain the car is travelling faster than the speed limit.

Academic Year		Calendar Year	
Course		Name of task/exam	

Question 26:

a) i $50 – $100 (not inclusive)

ii $850 (approx)

iii 27 km over the speed limit

iv See back of exam

v 4 km/h ; 13 km/h ;
(maybe 45 km/h → depends on graph).

vi Most of the fines in the present system are less than the new system. For this reason keeping the present system would minimise the fine. The exceptions are less than 4km/h over the speed limit ; between 10 – 13 km/h over the speed limit and around 45 km/h over the speed limit.

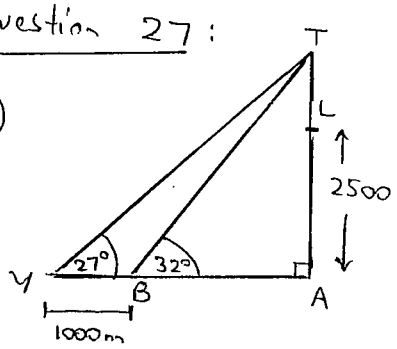
b) $N = M\left\{\frac{(1+r)^n - 1}{r(1+r)^n}\right\}$

$N = 2000\left\{\frac{(1+0.0075)^{48} - 1}{0.0075(1+0.0075)^{48}}\right\}$

$N = 80\,369.56$

Question 27:

a)



i $\angle YTA = 63°$

$\angle BTA = 58°$

$\therefore \angle YTB = 63 - 58$

$= 5°$

ii $\frac{TB}{\sin 27} = \frac{1000}{\sin 5}$

$TB = 5208.9568...$

$TB = 5209$ m (nrst m)

iii $\sin 32 = \frac{TA}{TB}$

$TA = TB \sin 32$

$= 2760.326...$

$\therefore TL = 2760.326... - 2500$

$= 260.3$ m (1 dp)

b) i $\bar{x} = 82.39$ (2 dp)

$\sigma_n = 8.23$ (2 dp)

Academic Year		Calendar Year	
Course		Name of task/exam	

ii

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

iii

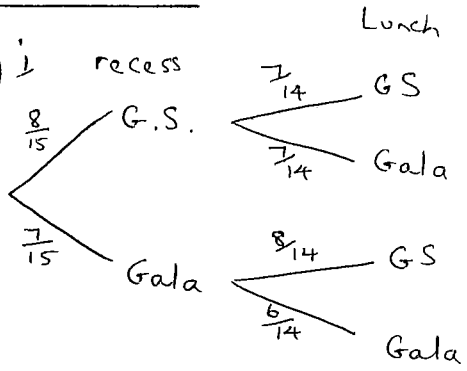
mode = 83, 90

median = 83

range = 95 − 67
= 28

Question 28 :

a) i



ii

$P(\text{both GS}) = \frac{8}{15} \times \frac{7}{14}$

$= \frac{4}{15}$

$\therefore A = \frac{4}{15}$

$P(GS, G \text{ or } G, GS)$

$= \frac{8}{15} \times \frac{7}{14} + \frac{7}{15} \times \frac{8}{14}$

$= \frac{8}{15}$

$\therefore B = \frac{8}{15}$

$P(GG) = \frac{7}{15} \times \frac{6}{14}$

$= \frac{1}{5}$

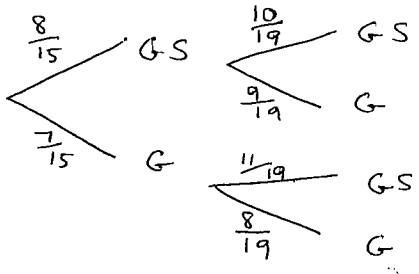
$\therefore C = \frac{1}{5}$

iii Financial exp $= 2 \times \frac{4}{15} - 1.5 \times \frac{8}{15} + 2 \times \frac{1}{5}$

$= 0.1\dot{3}$

$\doteq 13^c$

iv



$P(GS\ GS \text{ or } GG)$

$= \frac{8}{15} \times \frac{10}{19} + \frac{7}{15} \times \frac{8}{19}$

$= \frac{136}{285}$

b) i $A = M\left\{\frac{(1+r)^n - 1}{r}\right\}$

$18\,000 = M\left\{\frac{(1+0.005)^{48} - 1}{0.005}\right\}$

$18000 = M\{54.09\ldots\}$

$M = \$332.73$

ii $S = V_0(1-r)^n$

$S = 18\,000(1 - 12.5\%)^3$

$S = \$12\,058.59$

Question 26 a)

Student Number.....

Detach this page, complete the graph of the information in the table and attach it to your answers for Question 26a).