Saint Ignatius' College

Year 12 Half-Yearly

General Mathematics Examination 2008

Term 1

GENERAL INSTRUCTIONS

- ⇒ Reading Time – 5 minutes
- ⇒ Working Time - 2½ hours
- ⇒ Write using black or blue pen
- ⇒ Board approved calculators may be used
- ⇒ Write your name and teachers name on each answer booklet
- ⇒ A formulae sheet is provided at the back of this paper

Section I - IV

Total Marks – 100

- ⇒ Attempt all questions
- ⇒ 25 marks for each section

SECTION I
Equations and Functions
(25 marks)

Questions 1 – 5 are multiple choice. Select the best response and circle the answer in the corresponding answer booklet.

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1. Simplify $5(4x - 3) - 6(2x + 5)$

(a) $8x - 45$ (b) $8x + 15$ (c) $32x - 45$ (d) $32x + 15$

---

2. Simplify $8m^2c \div 4m^2c^2$

(a) $2c$ (b) $\frac{2}{c}$ (c) $\frac{c}{2}$ (d) $2m^0$

---

3. Which of the following is equal to 210 000 000 000?

(a) 2.1×10^{10} (b) 2.1×10^{11} (c) 2.1×10^{12} (d) 2.1×10^{13}

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4. If $A = 6s^2$, a possible value of s when A = 864 is:

(a) 6 (b) 12 (c) 24 (d) 144

---

5. Consider the following equation and solution.

$7x - 3(2x + 5) = 18$ ……. Line 1
$7x - 6x + 15 = 18$ ……. Line 2
$x + 15 = 18$ ……... Line 3
$x = 3$ ……. Line 4

There is an error in this solution. The error first occurs between:

(a) Line 1 and Line 2 (b) Line 2 and Line 3
(c) Line 3 and Line 4 (d) Line 2 and Line 4

Questions 6 onward require full working in your answer booklet

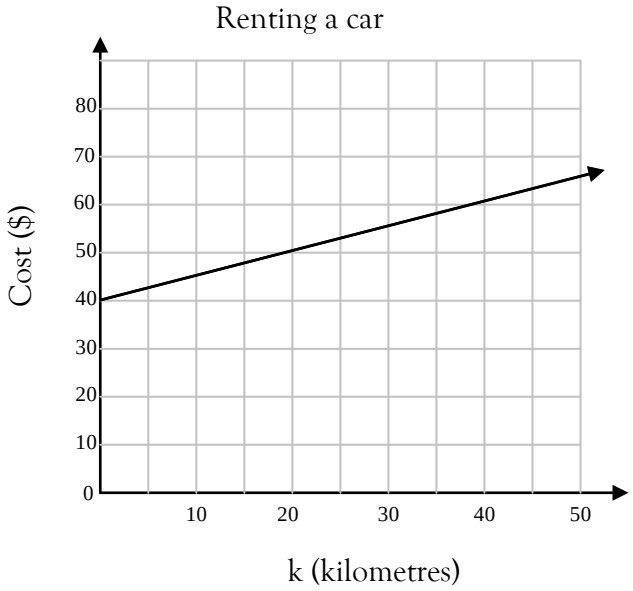
6. Use the formula $T = a r^{n-1}$ to find the value of T, when $a = 2$, $r = 3$ and $n = 4$. **1**

7. Solve the equation: $\frac{3p-3}{4} = \frac{3+5p}{6}$. **2**

8. Calculate $\frac{4.85\times10^{4}}{1.24\times10^{-8}}$.

(Express your answer in scientific notation correct to three significant figures) **2**

9. The cost of renting a car is \$40 plus 50c per kilometre (k) driven.

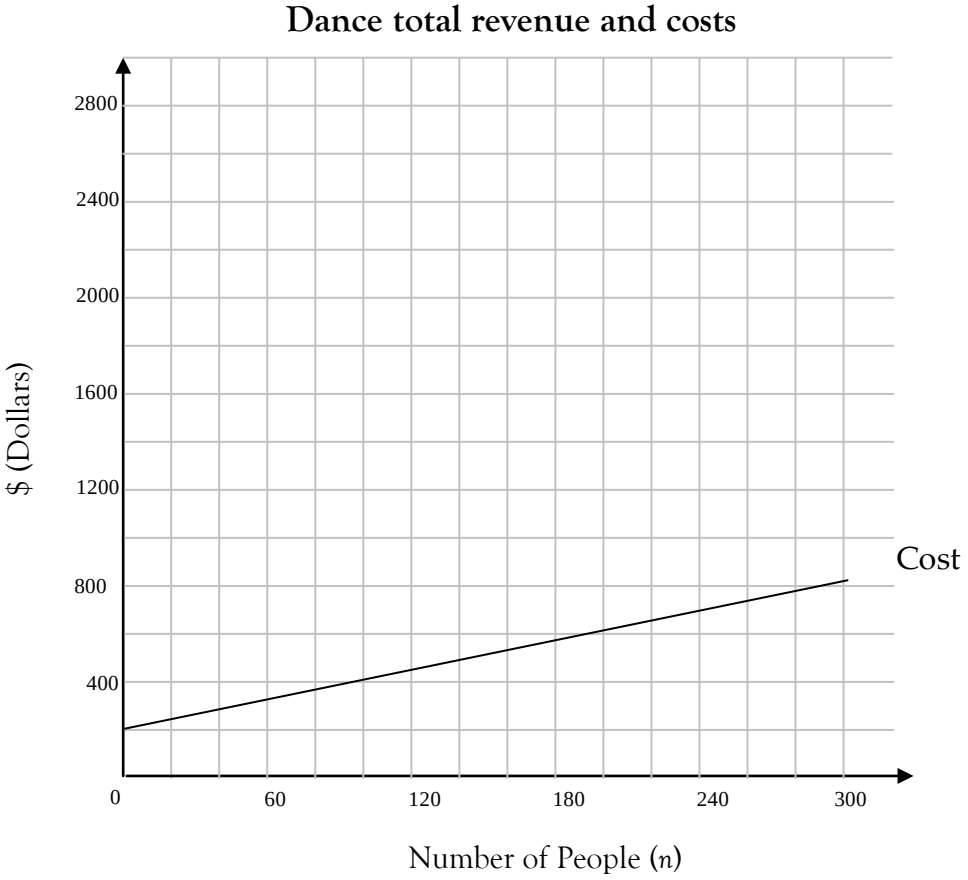


a. Write an algebraic expression for the cost C in terms of k **1**

b. What is the cost (in dollars) if the car was driven 50 km. **1**

c. If the total cost of the rental car is \$150. Write an equation and solve for k to find the distance travelled in the rental car. **2**

10. Below is a revenue and cost analysis graph created by organisers of a school dance.



The venue charges \$200 to hire the room, and the DJ charges \$2 per person. The organisers are intending to charge \$10 per person to attend the dance.

a. Explain why $C = 200 + 2n$ represents the cost (C dollars) involved in n people attending the dance. **1**

b. Write an expression to represent the revenue (R dollars) the organisers will receive for selling n tickets. (Note: revenue = income) **1**

c. In your answer booklet, sketch on the graph provided the revenue, to determine the number of people the organisers need to attend to break even. **2**

d. What profit will the organizers make if 300 people attend? **1**

e. How many people will he need to attend to make a profit of \$1600? **2**

Dance total revenue and costs

11. The directions on a bottle of medicine state the adult dose of the medicine is 60 mL. A child's dosage is found using the formula, $D = 75 - \frac{225}{A}$, where D is the child's dosage and A is the age of the child in years.

(a) Calculate the dosage of the medicine that should be given to a 5 year old. **1**

(b) Use the formula to demonstrate that the medicine should not be given to a child that is 3 years old or under. **1**

(c) Use the formula to determine at what age a person can begin to take the adult dose of the medicine. **2**

SECTION II
Area and Volume
(25 marks)

Questions 1 – 5 are multiple choice. Select the best response and circle the answer in the corresponding answer booklet.

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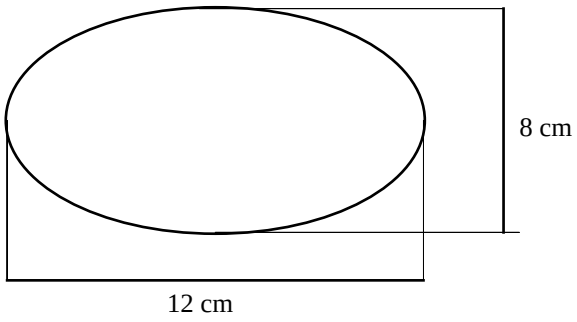
1. Which of the following expressions will correctly give the area of the ellipse drawn below?



(a) $\pi \times 10^2$

(b) $\pi \times 12 \times 8$

(c) $\pi \times 5^2$

(d) $\pi \times 6 \times 4$

---

2. Find the cost of painting the **four walls** of a rectangular room represented below, given that one square metre of paint costs $1.28.

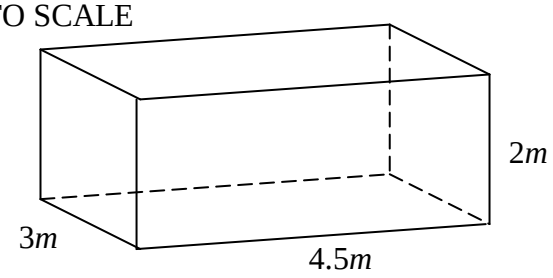
(a) $30

(b) $38.40

(c) $55.68

(d) $72.96

NOT TO SCALE



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3. The mass of a car is given as 894 kg, correct to the nearest kilogram. The maximum percentage error is closest to:

(a) 0.055% (b) 0.056% (c) 0.55% (d) 5%

---

4. The sector shown has an arc length of 12cm and radius 8 cm. The angle θ is closest to

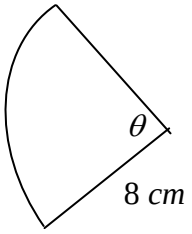
(a) 43^0

(b) 86^0

(c) 90^0

(d) 172^0

NOT TO SCALE



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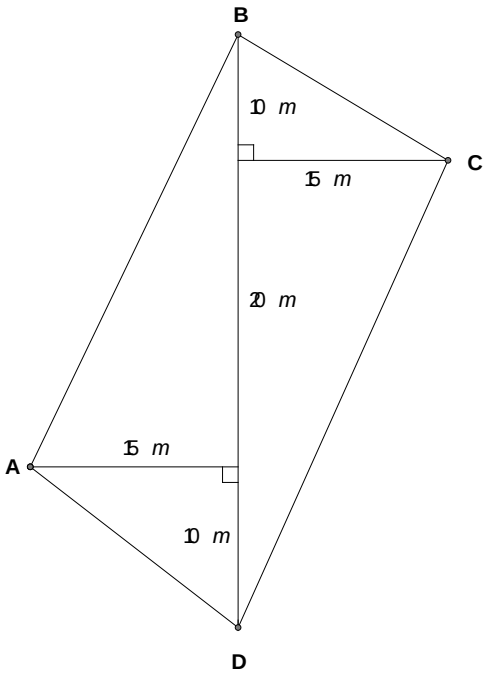
5. The perimeter of ABCD is closest to?

(a) 51.5 *m*

(b) 103 *m*

(c) 206 *m*

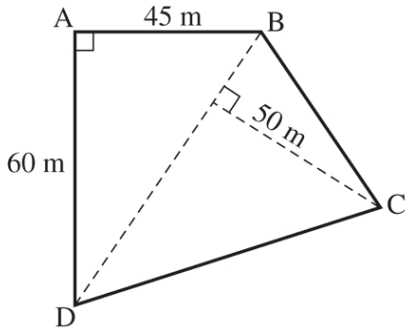
(d) 1200 *m*



Not to Scale

Questions 6 onward require full working in your answer booklet

6. The figure below shows a paddock on farmer Brown's property.



(a) Show that the distance BD is equal to 75 metres. **1**

(b) Find the area of the paddock in square metres. **2**

(c) Farmer Brown needs to fertilise the paddock before planting his spring crop. Fertiliser is sprayed at the rate of 1 litre per 12.5 m^2. Calculate the amount of fertiliser needed. **1**

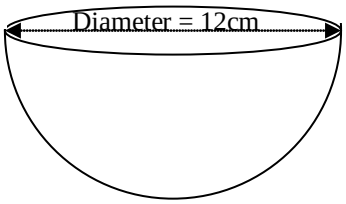
(d)The fertiliser can be purchased in three different containers: **2**

a. 100 litres for $450
b. 50 litres for $240
c. 10 litres for $85

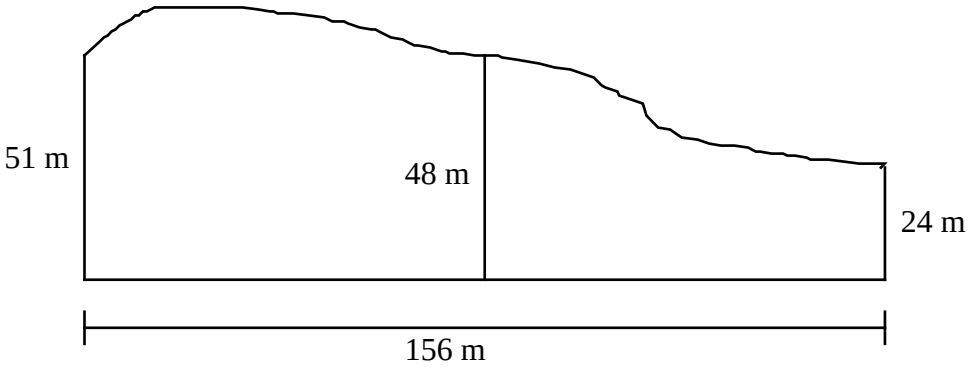
What combination of containers should Farmer Brown purchase to spend the least amount of money possible on fertiliser for a single spraying of this paddock?

7. The figure drawn below shows a **solid** plastic mould in the shape of a hemisphere.

Find the **total** surface area of the hemisphere. **2**
(correct to the nearest square centimetre)

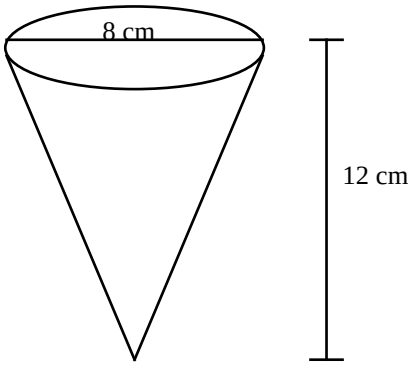


8. The figure below shows an irregular area of land. **2**



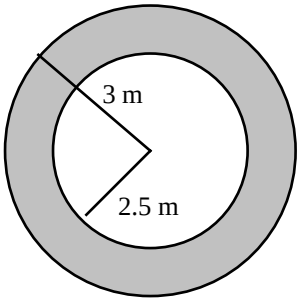
Use Simpson's rule to approximate the area of the block of land.

9. The figure below is of an ice-cream cone.



Find the volume of the ice-cream cone correct to 1 decimal place. **2**

10. The cross-section of cement piping with an outer radius of 3 metres and an inner radius of 2.5 metres is shown in the diagram below.



(a) Calculate the cross-sectional (shaded) area correct to 1 decimal place? **2**

(b) The piping comes in 5 metre lengths.
Calculate the volume of cement required to make one length of the pipe. **1**

(c) The cement weighs 225 kg/m^3.
Calculate the weight of each section of piping. Give your answer in ***tonnes***. **1**

11. The formula for the surface area of a closed cylinder is $SA = 2\pi rh + 2\pi r^2$.

Find the surface area of a closed cylinder with a radius of 4.9 cm and a height of 5.2 cm, correct to 2 decimal places. **2**

12. Find the radius of an open cylinder (not closed at either end) with a curved surface area of 754 cm^2 and a height of 10 cm, correct to 1 decimal place. **2**

SECTION III
Credits and Loans
(25 marks)

Questions 1 – 5 are multiple choice. Select the best response and circle the answer in the corresponding answer booklet.

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1. Mark borrowed $25 000 over 6 years for a business. His repayments were set at $650 per month.

   How much interest was charged over the life of the loan?

   (a) $650 (b) $3900 (c) $21 800 (d) $46 800

---

2. Steve and Amanda take out a home loan for $400 000. They make repayments of $2957 per month at an interest rate of 9% per annum , charged monthly, with no hidden fees.

   How much do they owe after one month?

   (a) $3 000 (b) $403 000
   (c) $397 043 (d) $ 400 043

---

3. Three boys each borrowed $15 000 to buy a car. They then proceeded to make the following repayments:

   - Brad - $500 a fortnight
   - Mark - $1000 a month
   - Tony - $12 000 a year

   Which of the boys pays the most each year?

   (a) Brad (b) Mark
   (c) Tony (d) They all contribute the same per year

---

4 The table shows the payments per $1000 on a monthly reducible loan.

Years	7%	7.25%	7.5%	7.75%	8%	8.25%
5	19.8012	19.9194	20.0379	20.1570	20.2765	20.3963
10	11.6108	11.7401	11.8702	12.0011	12.1328	12.2653
15	8.9883	9.1286	9.2701	9.4128	9.5566	9.7014
20	7.7530	7.9036	8.0059	8.2095	8.3644	8.5207
25	7.0678	7.2281	7.3899	7.5533	7.7182	7.8875

What is the monthly repayments on a loan of $85 000 over 20 years at 7.75% per annum is closest to?

(a) $8.21 (b) $680.50 (c) $697.80 (d) $167 484

---

5. A new Holden Commodore was advertised at $36 000. Tony bought the car with the conditions of making monthly repayments of $585 for 10 years.

What is the flat interest rate that Tony has agreed to pay?

(a) 1.625% (b) 9.5% (c) 16.25% (d) 19.5%

Questions 6 onward require full working in your answer booklet

6. Find the simple interest payable on a loan of $12 000 at a simple interest rate of 6% p.a. over a three year term. **2**

7. Lee agrees to take a personal loan of $5 000 and is charged 0.5% per month interest that is compounded monthly.

(a) Lee decides to pay off the loan in equal monthly instalments of $200 **2**
Find the amount owing, after interest has been charged and the first month's payment made.

(b) Find the total interest charged in the first two months of this loan. **1**

8. The table below gives the monthly payments in dollars for loans of $10 000.

Term (Years)	9.5%	10.0%	10.5%
15	104.40	107.50	110.40
20	93.20	96.50	99.70
25	87.40	90.80	94.10

(a) Determine the total paid for a loan of $140 000 at 9.5% over 25 years. **2**

(b) How much would you save in paying off a loan of $140 000 at 9.5% in **2**
20 years instead of 25 years?

9. A credit card charges interest of 0.075% per day on the outstanding balance. Anthony's credit card has an outstanding balance of $975. Calculate the balance on the credit card after a further two weeks. **2**

10. In June, Ms Holstein received a statement for her credit card account. The account has no interest free period. Simple interest is calculated and charged to her account on the statement date.

Ms M Holstein
Credit limit: $2000
Statement Date: 20 June 2007

Sum Bank
Credit card Statement

Previous Balance	**Payments**	**Purchases**	**Interest charged**
$263.83	**$263.83**	**$617.72**	

Date	Purchases	Amount
23 May	Concert Tickets	$617.72

Annual percentage rate: 18.2%
Daily percentage rate: 0.0498%

(a) For how many days is she charged interest on her purchase? **1**

(b) Calculate the interest charged to her account. **2**

11. Fran borrowed $5000 for an home theatre system at 7.2% per annum, monthly reducible and arranged to make monthly payments of $650. The first 2 months of her repayments are shown in the table below

N	Principal (P)	Interest (I)	P + I	(P +I) - R
1	$5 000	$30	$5 030	$ 4 380
2	$4 380	$26.28	$4 406.28	$3 756.28
3	$3 756.28	A	B	C

(a) Calculate the values that would be filled in for A, B , and C. **3**

(b) On the graph provided on your answer sheet show, the amount owing (after interest has been charged and repayments made) on Fran's loan for the first 3 months. **2**

(c) Estimate, using your graph after how many months, she will owe less than $2000. **1**

SECTION IV
Statistical distributions
(25 marks)

Questions 1 – 5 are multiple choice. Select the best response and circle the answer in the corresponding answer booklet.

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1. For the set of scores 2, 4, 5, 5, 6, 9, 9, 9 the median and mode are:

(A) Median = 5, Mode = 5
(B) Median = 5.5, Mode = 5
(C) Median = 5, Mode = 9
(D) Median = 5.5, Mode = 9

---

2. A weather station measures the minimum overnight temperature each night. Which of the following best describes the type of data collected?

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

---

3. Wilma is collecting data for a study on what type of take-away food outlet should be set up in her local area. To choose the participants in her survey Wilma selects equal numbers of males and females and ensures that the number of people in each age bracket is in the same proportion to the overall population. This is an example of:

(A) a stratified sample
(B) a systematic sample
(C) a random sample
(D) a discrete sample

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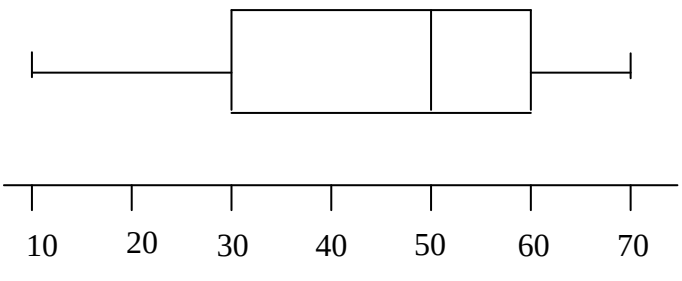
4. The median and interquartile range of the box and whisker plot are?

(A) 50 and 6
(B) 50 and 30
(C) 50 and 40
(D) 30 and 60



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5. Sandra's Mathematics class had a test and the results were as follows:

86 90 74 74 90 18 62 86 18 62

Which of the following statements best describes this set of data?

(A) The data is positively skewed
(B) The data is negatively skewed
(C) The data is symmetrical
(D) The data has a range of 24

Questions 6 onward require full working in your answer booklet

6. The following data represents the results of a class in a General Mathematics assessment task.

97 42 85 78 64 58 87 49 89 72

Calculate the mean and population standard deviation for the assessment task. **2**

7. The weight of 12 boys and 12 girls are represented in the following back-to-back stem-and-leaf plot.

BOYS		GIRLS
	4	7
9, 3	5	1, 1, 1, 4, 5, 9
9, 7, 7, 3, 1	6	1, 5, 5
7, 4, 2, 1	7	2, 4
4	8	

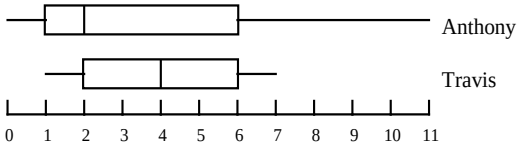
KEY: 4 | 7 = 47 kg

(a) The mean weight of Girls was 58.75. What is the mean weight of the boys? **1**

(b) For each set of data determine the interquartile range. **2**

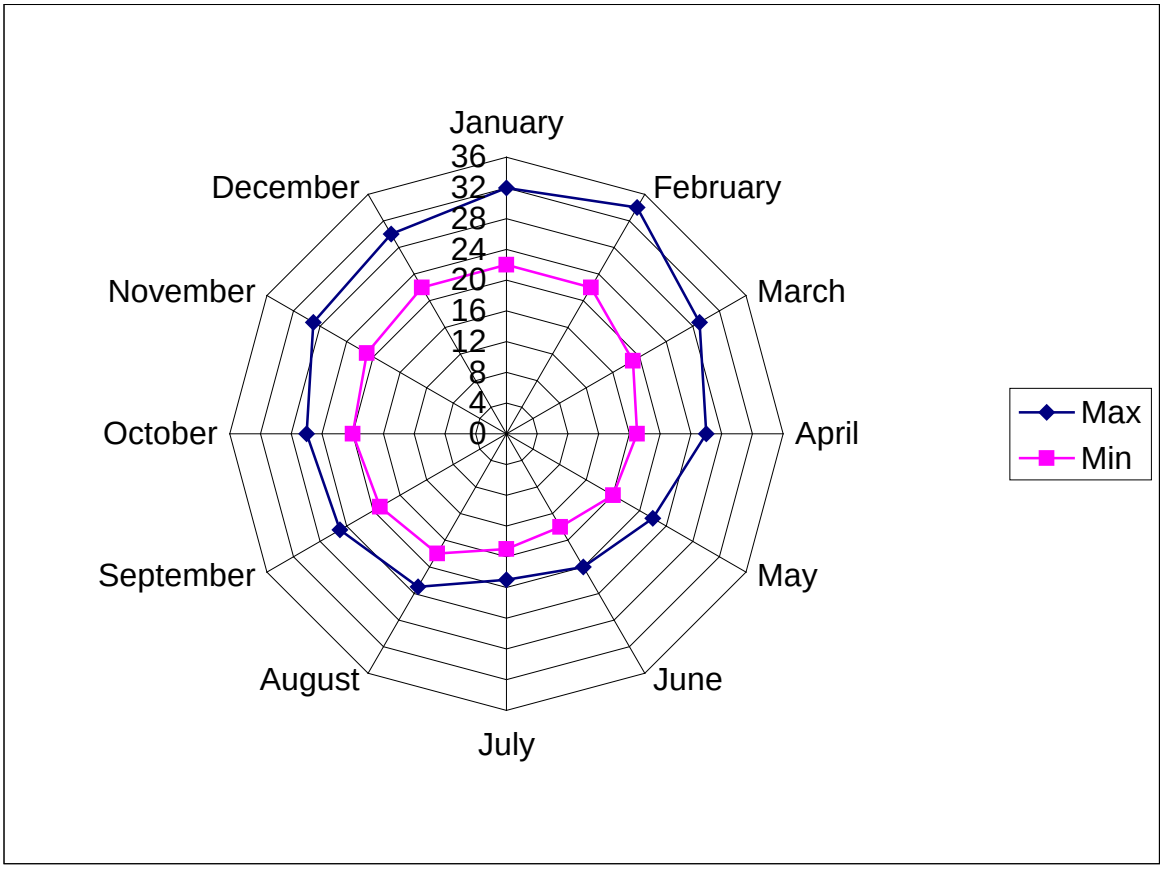
(c) Give a statistical reason why the group of boys are heavier. **1**

8. The data below shows the number of goals kicked by Anthony and Travis for their AFL team.



Describe the shape of the distribution for each player. **2**
(i.e. in terms of skewness, symmetry etc)

9. The graph below shows the average maximum and minimum temperature (^{o}C) at a holiday island resort.



(a) What is the average maximum daily temperature for March? **1**

(b) Which month has the lowest minimum daily temperature? **1**

(c) Which month has the greatest difference between the average daily maximum and minimum temperature? **1**

(d) Describe the annual weather pattern at this holiday resort. **2**

10. An experiment is conducted to compare the benefits of having professional driving lessons have on young drivers attempting to get their licence. The results of their first driving test are shown in the two-way table drawn below.

	Passed	Failed	TOTAL
Professional lessons	96	34	
Taught privately	87	43	
TOTAL			

(a) How many people were studied in the experiment? **1**

(b) How many drivers failed at their first attempt to get their licence? **1**

11. Outside the tuckshop, a new drink machine is installed for a 4-week trial period. The number of drinks sold each school day is shown below.

22	27	19	15	1
20	19	30	34	21
16	14	12	18	11
25	16	22	24	31

(a) Find the standard deviation of the data set.
Explain your choice of population or sample standard deviation. **2**

(b) Complete the frequency distribution table in your answer booklet. **1**

(c) On the grid provided in your answer booklet, draw a cumulative frequency histogram and polygon for the data. **1**

(d) Use your graph to estimate the median of the distribution. **1**

GENERAL MATHEMATICS

FORMULAE SHEET

Area of an annulus

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

$A = \frac{\theta}{360}\pi r^2$
$\theta =$ number of degrees in central angle

Arc length of a circle

$l = \frac{\theta}{360} 2\pi r$
$\theta =$ number of degrees in central angle

Simpson's rule for area approximation

$A \approx \frac{h}{3}(d_f + 4d_m + d_l)$

$h =$ 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 $V = \frac{1}{3}\pi r^2 h$
Cylinder $V = \pi r^2 h$
Pyramid $V = \frac{1}{3}Ah$
Sphere $V = \frac{4}{3}\pi r^3$
r = radius
$h =$ perpendicular height
$A =$ area of base

Sine rule

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

Area of a triangle

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

Cosine rule

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

or

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

Simple interest

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

Compound interest

$A = P(1+r)^n$
A = final balance
P = initial quantity
r = percentage interest rate 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:

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

St Ignatius' College Riverview

General Mathematics Year 12 Semester One Exam 2008

*Suggested Solutions
*Markers Comments

Name: _____
Teacher's Name: _____

SECTION I – ANSWER SHEET
Equations and Functions
(25 marks)

Multiple Choice
Circle the 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

Well Done

Marks Comments

6. $T = ar^{n-1}$
$T = 2(3)^{4-1}$
$T = 2(3)^3$
$T = 2(27)$
$T = 54$ (1)

poorly done remember order of operations/ grouping symbols.

7. $\frac{3p-3}{4} = \frac{3+5p}{6}$
$\frac{12(3p-3)}{4} = \frac{12(3+5p)}{6}$
$3(3p-3) = 2(3+5p)$ (1)
$9p-9 = 6+10p$
$-15 = p$
$\therefore p = -15$ (1)

GOOD.

8. $\frac{(4.85 \times 10^4)}{(1.24 \times 10^{-8})}$
$= (4.85 \div 1.24) \times (10^4 \div 10^{-8})$
$= 3.91129323 \times 10^{12}$ (1)
$= 3.91 \times 10^{12}$ (to 3 sig. figures) (1)

GOOD

Name: _____
Teacher's Name: _____

Marks | Comments

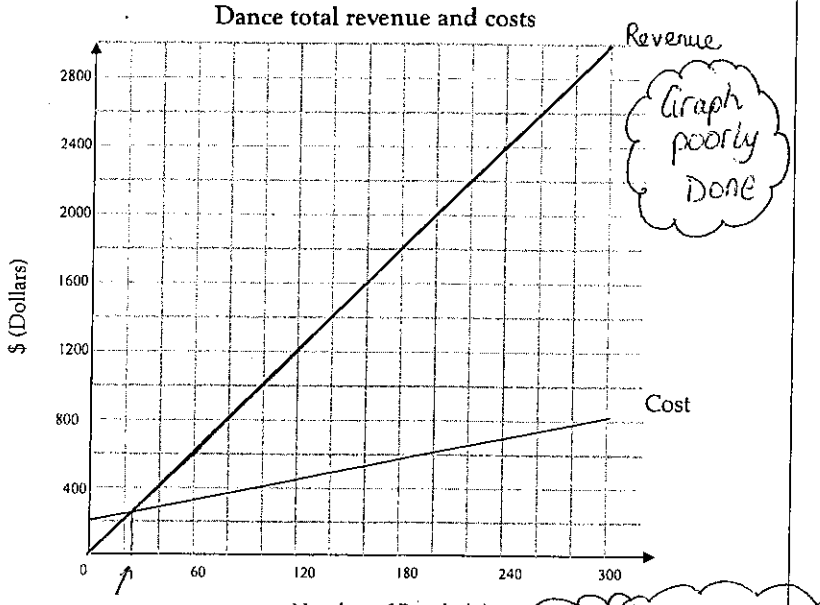
9.

(a) $C = 40 + 0.5k$ | 1 | Good

(b) $C = 40 + 0.5(50)$
$= 40 + 25$
$= \$65$ (accept \$65 or \$66 if read from graph). | 1 | Good

(c) $C = 40 + 0.5k$
$150 = 40 + 0.5k$
$110 = 0.5k$
$220 = k$
$k = 220\text{km}$ | 1 | * must show equation to get 1 mark

10. [Answer part (c) on the diagram below]



Graph poorly Done

approx 23 people to break even

many people forgot to find number to break even

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Marks | Comments

10. cont....

(a) $200 \rightarrow$ \$200 room hire
$2n \rightarrow$ \$2 per person that attends (n = number that attend).
$\therefore 200 + 2n$ | 1 | Well Done

(b)

$R = 10n$ | 1 | Good

(c) [Answer part (c) on the diagram on the previous page] approx 25 people

(d)

Profit = Revenue − Cost
$= 10(300) - [200 + 2(300)]$
$= 3000 - 800$ (could be read from graph).
$= \$2200$ | 1 | Good

(e)

Profit $= 10n - [200 + 2n]$
$1600 = 10n - 200 - 2n$
$1800 = 8n - 200$
$1800 = 8n$
$n = 225$ people | 1 | Poorly Done – more logical working needed

11. $D = 75 - \frac{225}{A}$

(a) $D = 75 - \frac{225}{5}$
$D = 30$ mL | 1 | Very Well Done

Name: _____
Teacher's Name: _____

11 continued	Marks	Comments
(b) $D = 75 - \frac{225}{3}$ $D = 75 - 75$ $D = 0$ No child '3' should be given medicine (less than 3 will give negative numbers).	1	Well Done
(c) Adult dosage = 60ml $60 = 75 - \frac{225}{A}$ $\frac{225}{A} = 15$ $15A = 225$ $A = 15$ A person can take the adult dosage at 15.	1 1	Good. But some boys didn't answer question clearly.

Name: _____
Teacher's Name: _____

SECTION II - ANSWER SHEET
Area and Volume
(25 marks)

Multiple Choice
Circle the 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

	Marks	Comments
6. $BD^2 = 45^2 + 60^2$ (a) $BD^2 = 2025 + 3600$ $BD^2 = 5625$ $BD = \sqrt{5625} = 75$	1m for 75	
(b) Area = $\triangle ABC + \triangle BCD$ $= 0.5 \times 45 \times 60 + 0.5 \times 75 \times 50$ $= 1350 + 1875$ $= 3225\ m^2$	2	1350 – 1m or 1875 – 1m.
(c) $12.5m^2 = 1L$ $3225\ m^2 = xL$ $12.5x = 3225$ $x = 258$ L of fertiliser	1	If another number other than 3225 brought thru, mark awarded.
(d) Cheapest solution $2 \times 100L$ @ \$450 = \$900 $1 \times 50L$ @ \$240 = \$240 $1 \times 10L$ @ \$85 = \$85 Total = \$1225	2	Mark awarded based on answer to (c).
7. SA hemisphere = $2\pi r^2 + \pi r^2$ $= 3\pi r^2$ $= 3 \times \pi \times 6^2$ $= 108\pi$ $= 339\ cm^2$.	2	Question marked hard.

Name: _____
Teacher's Name: _____

Marks | Comments

8.

$A \doteq \frac{h}{3}(d_f + 4d_m + d_l)$

$\doteq \frac{78}{3}[51 + 4(48) + 24]$ · Subs write 1m

$\doteq 6942\,m^2$

answer (1m)

- Mark off for any incorrect substitution
- No mark awarded for just formula.

9.

$V_{cone} = \frac{1}{3}\pi r^2 h$

$= \frac{1}{3} \times \pi \times 4^2 \times 12$

$= \frac{1}{3} \times \pi \times 16 \times 12$

$= 64\pi$

$= 201.0619...$ ← Accepted at this point (full marks)

$= 201.1\ cm^3$

Did not penalise for decimal place error

Name: _____
Teacher's Name: _____

Marks | Comments

10. Area annulus $= \pi[R^2 - r^2]$

(a) $= \pi[3^2 - 2.5^2]$ (1)

$= 2.75\pi$

$= 8.6\,m^2$

2

(-1 If not correct formula and wrong answer)

(b) $V = Ah$

$= 8.6 \times 5$ (1)

$= 43\,m^3$ carry through

1

Carry through -

(c) weight $= 43 \times 225$ (1)

$= 9675\,kg$ (tonnes)?

$= 9.675$ tonnes.

1

- carried through errors accepted.

11. $SA = 2\pi rh + 2\pi r^2$

$= 2 \times \pi \times 4.9 \times 5.2 + 2 \times \pi \times 4.9^2$ (1)

$= 50.96\pi + 48.02\pi$

$= 98.98\pi$

$= 310.95\ cm^2$

2

Correct substituting mark awarded.

- (No 2dp -1)

12. Curved surface area $= 2\pi rh$

$754 = 2\pi rh$

$754 = 2 \times \pi \times r \times 10$

$754 = 20\pi r$

2

$\frac{754}{20\pi} = r$

$r = 12.0\ cm$.

- (-1 if not to 1dp)

Name: _____
Teacher's Name: _____

SECTION III – ANSWER SHEET
Credit and Loans
(25 marks)

Multiple Choice
Circle the correct answer

1	a	b	✗	d
2	✗	✗	✗	✗
3	✗	b	c	d
4	a	b	✗	d
5	a	✗	c	d

WELL DONE
ALL CORRECT
WELL DONE
WELL DONE
HAD TO FIND INTEREST FIRST!

	Marks	Comments
6. $I = PRT$ $= 12000 \times 0.06 \times 3$ $= \$2160$	1 1	WELL DONE.
7. (a) $I = 5000 \times 0.005 \times 1 = 25$ Amount owing $= 5000 + 25 - 200$ $= \$4825$	1 1	MANY STUDENTS ONLY FOUND I WITHOUT SUBTRACTING REPAYMENT TO FIND AMOUNT OWING. TIME PERIOD IS 1 NOT 1/12 !!
(b) $I_2 = 4825 \times 0.005 \times 1 = \$24.13$ Total interest $= \$25 + \$24.13$ $= \$49.13$	 1	HAD TO ADD THIS TO I FOUND IN 7(a). (NOT DONE WELL).
8. (a) $87.40 \times 12 \times 25 \times 14$ $= \$367080$	1 1	DONE VERY WELL
(b) $93.20 \times 12 \times 20 \times 14$ $= \$313152$ Save $= \$367080 - \$313152$ $= \$53928$	1 1	DONE VERY WELL

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Name: _____
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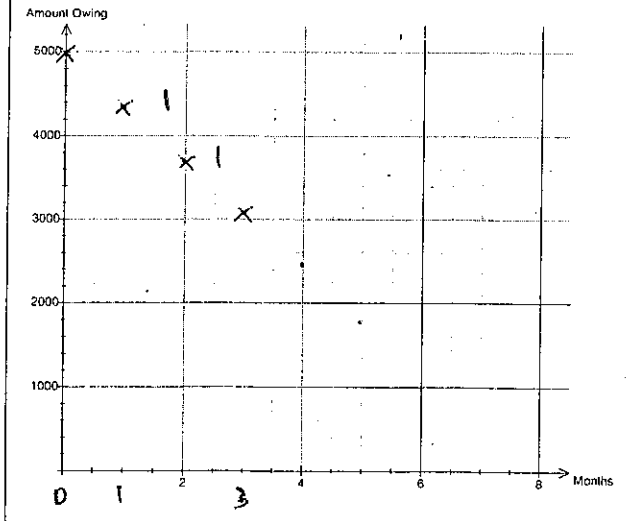
	Marks	Comments
9. I $= \$975 \times 0.00075 \times 14$ $= \$10.24$ Balance $= \$975 + \$10.24$ $= \$985.24$	1 1	SOME STUDENTS USED COMPOUND INTEREST, WHICH IS WRONG!!
10 (a) 28 days	1	IF INCLUDED MAY 23 THEN 29 DAYS
(b) I $= 617.72 \times 0.000498 \times 28$ $= \$8.61$ (If a student uses 29 days the answer would be \$8.92)	1 1	DONE WELL.

Name: _____
Teacher's Name: _____

		Marks	Comments
11.	$A = 3756{\cdot}28 \times \frac{0{\cdot}072}{12} = \$22{\cdot}54$	1	
(a)	$B = 3756{\cdot}28 + 22{\cdot}54 = \$3778{\cdot}82$	1	DONE WELL!
	$C = 3778{\cdot}82 - 650 = \$3128{\cdot}82$	1	

(b)



POINTS HAD TO BE PLOTTED CORRECTLY.

(c) 5 months 1

ACCEPTED ⇒ 4 TO 5 MONTHS
⇒ ABOUT 4 MONTHS

NOT ⇒ 6 MONTHS
⇒ ABOUT 6 MONTHS

Name: _____
Teacher's Name: _____

SECTION IV – ANSWER SHEET
Statistical distribution
(25 marks)

Multiple Choice
Circle the 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

		Marks	Comments
6.	$\bar{x} = 72{\cdot}1$ ✓		* Well Answered
	$\sigma_n = 17{\cdot}42$ (population) ✓		* Well Answered
7.			
(a)	$\bar{x}_{boys} = 68{\cdot}08kg$ ✓		* Well Answered.
(b)	Boys IQR = 73 − 62 = 11 ✓		* Well Answered
	Girls IQR = 65 − 51 = 14 ✓		
(c)	Mean (Median) ~~are~~ is higher. OR ✓		* Various Accepted. * Well Answered.
	Boys data is negatively skewed (Clustered in 60's, 70's) Girls data is positively skewed (Clustered in 50's, 60's).		
8.	Anthony → positively skewed		* Well Answered.
	Travis → symmetrical ✓✓		* Clue given on paper ie Skewness, symmetry).

Name: _____
Teacher's Name: _____

Marks Comments

9.

(a) Accept 29°C or 30°C ✓
* Only either of those 2 accepted.
* Well answered.

(b) June ✓
* Well Answered

(c) February ✓
* Well Answered.

(d) Any 2 of the following:
(i) Southern hemisphere
ii) Hottest month: Feb, Jan, Mar. ✓✓
iii) Coolest month: June, July, May
iv) Least difference Max/Min. May–Aug.
v) Temperate – sub-tropical climate
* Most popular answer.
Summer = Hot (Dec, Jan, Feb)
Winter = Cold (Jun, July)

10.

(a) 260 people. ✓
* Well answered.

(b) 77 drivers ✓
* Well Answered.

11.

(a) $\sigma_n = 7.49$ ✓
* σ_{n-1} 7.68 (incorrect).

Population standard deviation as this is ALL the drinks sold over the 4 week trial period. ✓
* Make sure you know
σ_n = population
σ_{n-1} = sample.

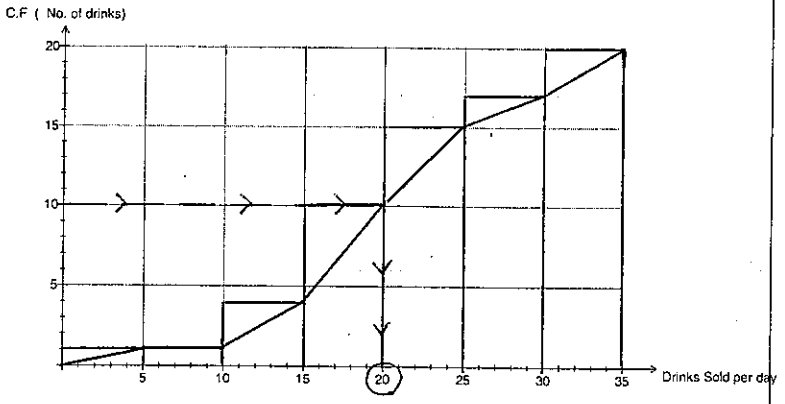
Ruby Wadsworth

11 continued

Name: _____
Teacher's Name: _____

Frequency distribution table for Question 11(b) Section IV

Class	Class centre	Tally	Frequency	Cumulative frequency
0 – 4	2	I	1	1
5 – 9	7		0	1
10 – 14	12	III	3	4
15 – 19	17	𝍸 I	6	10
20 – 24	22	𝍸	5	15
25 – 29	27	II	2	17
30 – 34	32	III	3	20



✓

✓

(d)

Median = 20.
(Accept 19 or 20).
19.5 accepted.

✓