



Name.....
2005
Trial Examination

General Mathematics

General Instructions

- Reading Time – 5 minutes
- Working Time - 2½ Hours
- Write using blue or black pen.
- Calculators and graphics calculators may be used.
- A formula sheet is provided at the back of this paper.

Section I (pages 2 – 6)

Total marks: 22

- Attempt questions 1 – 22
- Circle the correct answers to questions 1 – 22 on this page below.
- Allow about 30 minutes for this section

Section II (pages 7 – 14)

Total marks ; 78

- Attempt questions 23 – 28
- Allow about 2 hours for this section.

Section I Answers

- | | | | | |
|----|---|---|---|---|
| 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 |

Section 1: Multiple Choice (22 Marks)

1. 40 people are asked to name their favourite ABC radio program as shown in the table.

The Science Show	Life Matters	The Religion Report	Australia Talks Back	Late Night Live
8	6	12	5	9

What is the relative frequency of the most popular program?

- (A) $\frac{9}{40}$ (B) 40 (C) $\frac{3}{10}$ (D) 12

2. Use the formula $s = ut + \frac{1}{2}at^2$ to find s if $u = 8$, $t = 5$, $a = 10$

- (A) 90 (B) 165 (C) 665 (D) 1290

3. Two coins are tossed. What is the probability of throwing one head and one tail?

- (A) $\frac{1}{3}$ (B) $\frac{1}{4}$ (C) $\frac{1}{2}$ (D) $\frac{2}{3}$

4. Amy borrows \$5000 at an interest rate of 12% per annum, compounded monthly. She makes monthly payments of \$200. The balance sheet for this reducing balance loan is shown below.

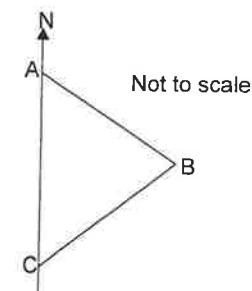
Month	Balance at start of month	Monthly interest	Monthly repayment	Balance at end of month
1	\$5000	\$50	\$200	\$4850
2	\$4850	X	\$200	

What amount should replace the X

- (A) \$50 (B) \$582 (C) \$600 (D) \$48.50

5. Point B has a bearing of 120° from A and 050° from C. The size of angle ABC is

- (A) 90°
(B) 70°
(C) 60°
(D) 80°



- 6 Arnold has just retired and his superannuation has been paid to him as a lump sum. He wishes to purchase an annuity which will pay him a monthly amount for the next 15 years. Which formula should be used to calculate the monthly amount?

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

(C) $A = P(1+r)^n$ (D) $N = \left[\frac{A}{(1+r)^n} \right]$

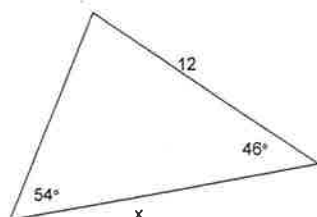
7. Simplify $10x^2 - 2x(x-3)$

(A) $8x^2 + 6x$ (B) $14x^3$ (C) $8x^2 - 6x$ (D) $2x$

8. In the diagram, which of the following expressions will give the value of x ?

(A) $x = \frac{12 \sin 54}{\sin 46}$ (B) $x = \frac{12 \sin 46}{\sin 54}$

(C) $x = \frac{12 \sin 80}{\sin 54}$ (D) $x = \frac{12 \sin 54}{\sin 80}$



9. The stopping distance of a vehicle on application of the brakes varies as the square of the speed. If the speed doubles the stopping distance will:

(A) double (B) multiply by 4 (C) half (D) quarter

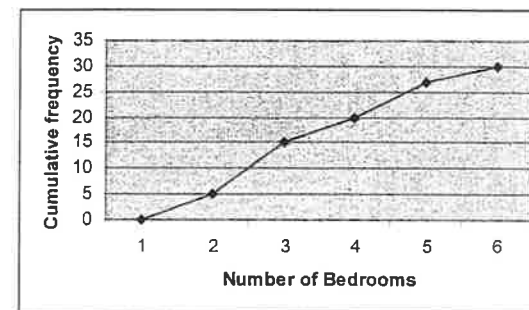
10. The time difference between 30° N , 15° E and 15° S , 15° E is:

(A) 1 hour (B) 0 hours (C) 3 hours (D) 4 hours

11. A can of tuna has a mass of 250 grams (to the nearest 10 grams). Within what range is the mass of the can?

(A) 249.5 to 250.5 (B) 240 to 250 (C) 245 to 255 (D) 249 to 251

12. The ogive (cumulative frequency polygon) plotted below shows the number of bedrooms in 30 houses in a street.



The median number of bedrooms per house in this street is

(A) 3.5 (B) 15 (C) 3 (D) 4

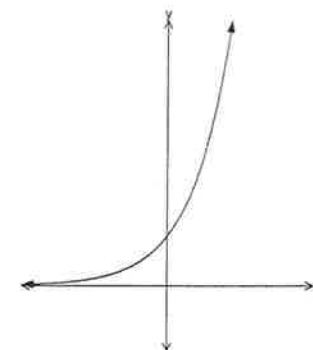
13. The equation of the graph shown could be

(A) $y = x^2$

(B) $y = (0.5)^x$

(C) $y = 2^x$

(D) $y = \frac{2}{x}$



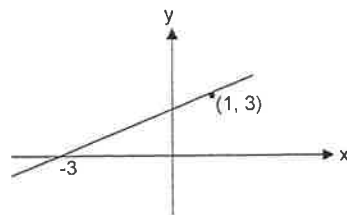
14. The two-way table below shows the results of pregnancy tests:

	Accurate test	Not accurate test	TOTAL
Pregnant	110	10	120
Not pregnant	60	20	80
TOTAL	170	30	200

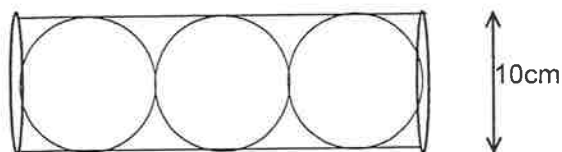
The percentage of women whose pregnancy test was positive.

(A) 65% (B) 75% (C) 60% (D) 85%

15. The gradient of the line shown is



- (A) $\frac{4}{3}$ (B) $\frac{3}{4}$ (C) $\frac{3}{2}$ (D) $\frac{1}{6}$
16. The cost of a box of chocolates is \$22 and this includes 10% GST. Find the amount of GST.
- (A) \$2.20 (B) \$24.20 (C) \$20 (D) \$2
17. A cylindrical tube can hold 3 balls with diameter 10cm. The balls fit snugly so that there is no space to move.



The volume of the tube in cubic centimetres is

- (A) 750π (B) 3000π (C) 600π (D) 1000π
18. For the unordered stem-and-leaf plot shown, the range is closest to

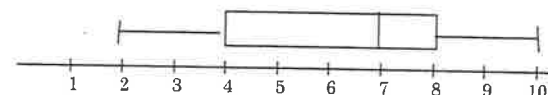
- (A) 7 (B) 44
(C) 4 (D) 47

STEM	LEAF
10	4 3 4 2
11	1 5 9
12	4 9 9 9 5
13	2 0 7 1
14	3 8 9 8

19. Ten people were on standby at Sydney airport waiting for a flight to Balina. Four seats became available. How many groups of four people could be chosen to fill the seats?

- (A) $\frac{10 \times 9 \times 8 \times 7}{4 \times 3 \times 2 \times 1}$ (B) $10 \times 10 \times 10 \times 10$
(C) $4 \times 3 \times 2 \times 1$ (D) $10 \times 9 \times 8 \times 7$

- 20.



Which of the following statements is incorrect?

- (A) The median is 7
(B) The IQR is 4
(C) About 50 % of the data is less than 7.
(D) The data set is positively skewed.
21. Michelle earns \$200 a week. Her employer wishes to increase her wage by 10% but gives her a 15% increase by mistake. By what percentage should the employer decrease the new amount in order to give her the amount that was intended?
- (A) 4.5% (B) 4.3% (C) 5% (D) 4.8%

- 22.

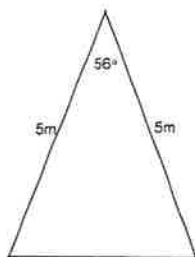
Taxable income	Tax payable
\$1-\$6000	Nil
\$6001-\$20000	17 cents for each \$1 over \$6000
\$20001-\$50000	\$2380 + 30 cents for each \$1 over \$20000
\$50001-\$60000	\$11380 + 42 cents for each \$1 over \$50000
\$60001 and over	\$15580 + 47 cents for each \$1 over \$60000

At the end of the financial year Mary's tax was \$13576.60. What was her taxable income?

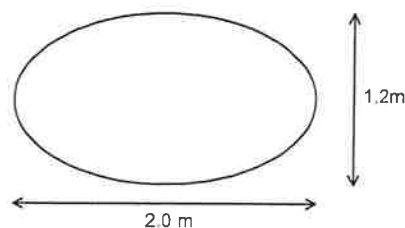
- (A) \$6001-\$20000 (B) \$55230 (C) \$1288 (D) \$11380

Section II Questions 23 – 28 : 6 questions: 13 Marks each (Total 78 Marks)**Question 23 (13 Marks)**

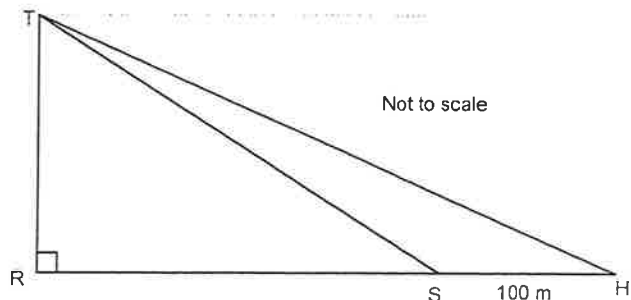
- (a) A spinnaker sail on a yacht is in the shape of an isosceles triangle with sides each 5 metres long and the angle at the top is 56° as shown. Find the area of the sail. **2**



- (b) A solid wood elliptical table top is made from teak and is shown in the diagram



- (i) Find the area of the table top. **2**
- (ii) The wood is 4 cm thick and a cubic metre of solid teak weighs 820 kg. Find the weight of the table top. **2**
- (c) A swimmer S is seen from the lifesaver beach tower T at an angle of depression of 20° . The swimmer swims 100 metres out to sea (H) and the angle of depression is then 15° .



- (i) Copy the diagram and show the angle sizes of $\triangle TSH$ on it. **1**

- (ii) Show that the length ST is 297m (to the nearest m) **2**
- (iii) Find distance RS **2**
- (iv) When at point H the swimmer raises her arm to indicate that she needs help. If the life saver takes 4 minutes to descend from the tower and fire up the rubber ducky and can travel at 10 km/h through the surf, how long will the lifesaver take to reach her. Answer to the nearest minute. **2**

Question 24 (13 Marks)

- (a) A criminologist studying crime in Bondi Junction found a linear relationship between P, the number of police on patrol, and C, the number of crimes committed per week. The results were tabulated below.

P (no. of police)	5	15	25	30
C (crimes per week)	310	280	250	235

- (i) What is the independent variable? **1**
- (ii) Find the linear function of the form $C = mP + b$ **2**
- (iii) What is the gradient and what does it represent? **1**
- (iv) What is the vertical intercept and what does it represent? **1**
- (v) Use the function to estimate the number of police on duty when 245 crimes are committed. **2**
- (b) Two dice are thrown.
- (i) Draw a grid display to show all possible outcomes. **1**
- (ii) The numbers showing on the two dice are added. Find the probability of throwing
- (A) a sum of 7 **1**
- (B) a sum of at least six **1**

- (c) At recess in the staff room there are 3 types of coffee available from the machine: short black, cappuccino, and flat white. Mr Sewell and Mrs Raeburn each choose a coffee at random

- (i) Draw a tree diagram
(ii) What is the probability both choose cappuccino?
(iii) What is the probability that at least one chooses a cappuccino?

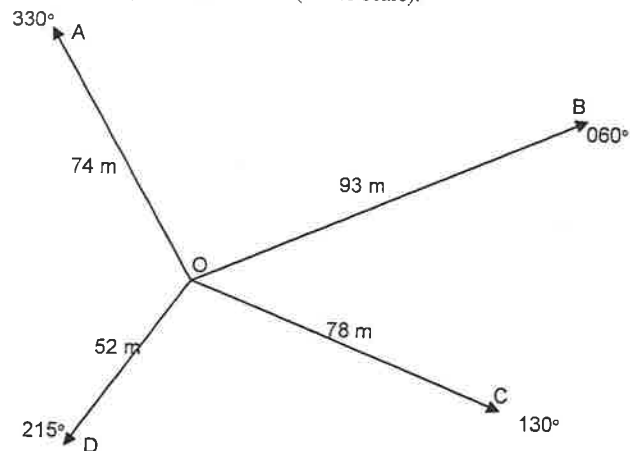
1

1

1

Question 25 (13 marks)

- (a) A radial survey is shown below (not to scale).



- (i) Find the size of angle DOC.
(ii) Find length DC correct to the nearest metre.
- (b) If you could dig a hole from Durban, South Africa (30°S , 31°E) in a straight line right through the centre of earth, what would be the coordinates of the place you would emerge on the other side of the world?
- (c) Calculate to the nearest kilometre, the great circle distance from Mawson, Antarctica (67°S , 63°E) to Chelyabinsk, Russia (54°N , 63°E). Radius of Earth is 6400 km.
- (d) (i) Point A (0° , 15°E) is 6000 n. miles east of point B which is also on the equator. Find the coordinates of B.
(ii) If it is 5pm at point A, what time is it at point B?

1

3

2

3

2

2

Question 26 (13 marks)

- (a) Lauren is self-employed and has decided to invest to provide for an early retirement in 25 years time. She pays \$1000 each quarter into a special account which pays interest of 8.4% per annum, compounded quarterly.

How much will she have in 25 years?

3

- (b) Laura installed a new dishwasher in the rental property that she owns. The function $S = 1200 - 200n$ gives its depreciated value \$S after n years.

(i) How much did the dishwasher cost new?

1

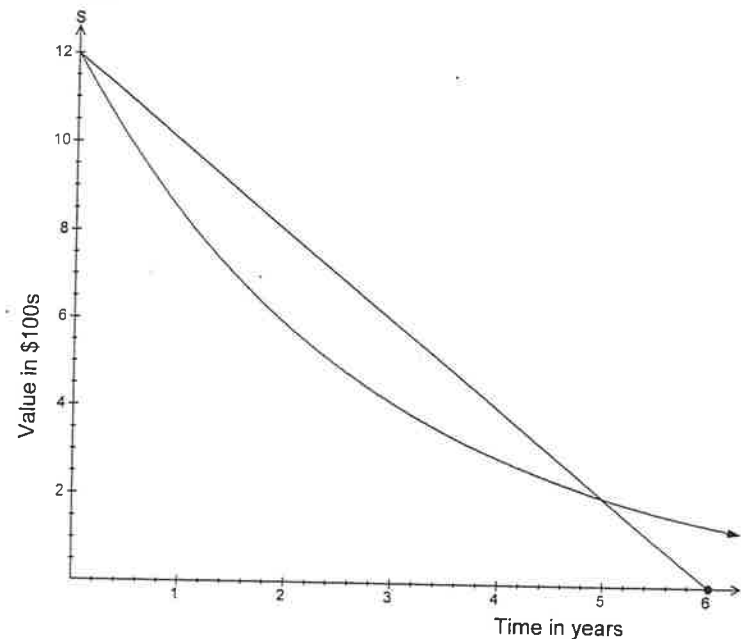
(ii) What is the annual depreciation?

1

(iii) After how many years would the dishwasher be written off? (i.e. the value of the dishwasher is \$0)

1

- (iv) When Laura claims depreciation for income tax purposes she can use either the straight line method or the declining balance method. The graph shows the salvage value using both methods.



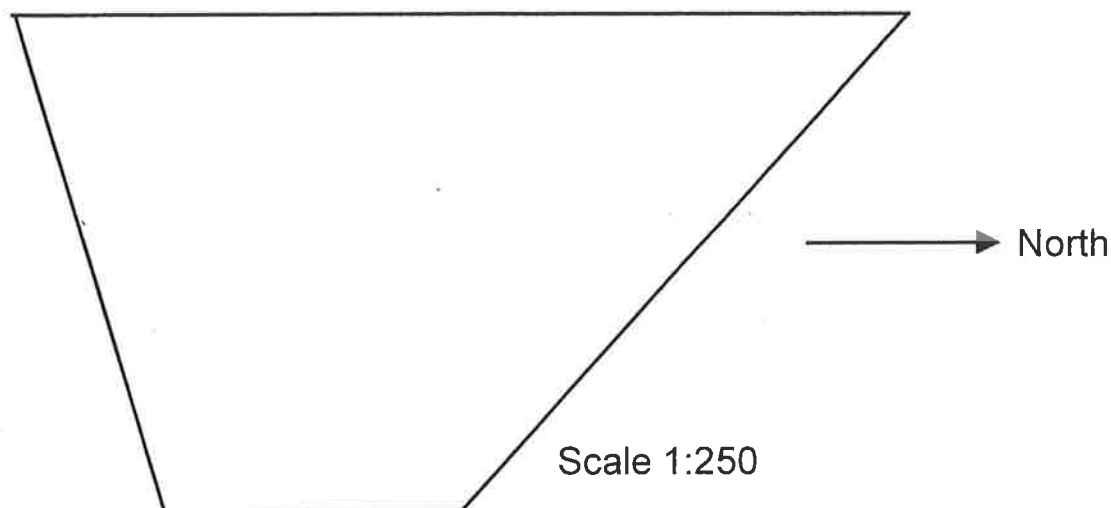
If Laura wants the maximum taxation deduction possible for the first two years then which method should she use. Explain your answer.

1

- (c) Harriet borrows \$10 000 to her finance further education. She need not pay the money back until she is earning \$30 000 per annum but until then she is charged interest at the rate of 6% p.a., compounded monthly.
- (i) Harriet does not make any payments on the loan for 5 years. Show that at the end of 5 years she owes \$13 489 (to the nearest \$). 2
- (ii) Harriet now starts to repay the loan and plans to do this over 3 years. If the rate of interest remains at 6% p.a. compounded monthly, calculate her monthly repayment. 2
- (iii) Find the total amount repaid. 1
- (iv) How much interest has Harriet paid? 1

Question 27 **(13 marks)**

- (a) A house is to be built on this block of land which is in the shape of a trapezium



- (i) The house is 6.5m wide. How long would this be on the scale drawing ? 1
- (ii) By measurement and calculation find the area of the block of land. 3
- (b) A ball is thrown by Edwina and its height above ground level is given by

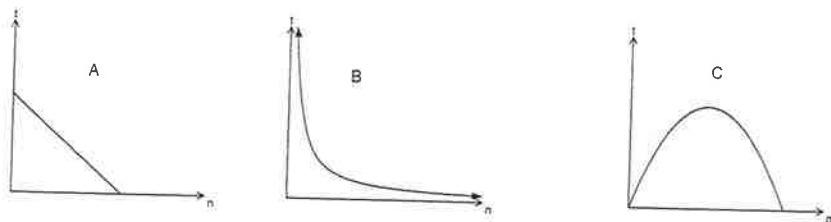
$$h = 3 + 2t - t^2$$

where h is the height in metres and t the time in seconds.

- (i) Graph $h = 3 + 2t - t^2$ on the graph paper attached. 2
- (ii) How high above ground level is the ball released from Edwina's hand?
What does this say about Edwina? 2
- (iii) What is the maximum height reached by the ball? 1

- (iv) If Kath catches the ball when it is 1 metre above ground level, for approximately what values of t does this quadratic model apply? 1
- (c) The time (t mins) taken to ensure that the grounds are tidy varies inversely as the number of form 6 students (n girls) on duty.

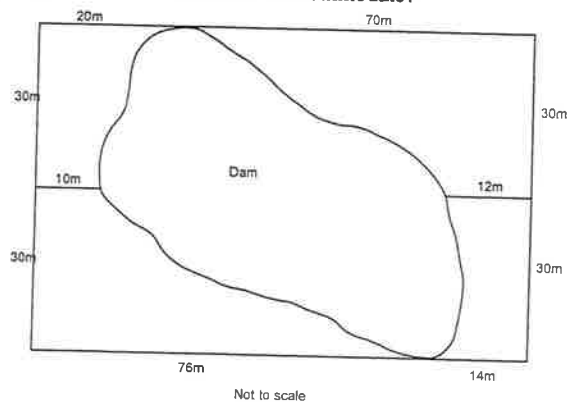
(i) Which of the following graphs best models this? 1



- (ii) If it takes 15 mins to tidy the grounds when five girls are on duty, how long will it take if only 2 girls show up? 2

Question 28 (13 marks)

- (a) The number of chickens in the barnyard of a farm that sells *Free Range* eggs is given by $C = 2500(1.7)^{0.2t}$ where t is the number of years since January 2000.
- (i) Find the number of chickens in January 2005, correct to the nearest 100. 1
- (ii) The RSPCA will take action if the number of chickens is greater than 2.5 per m^2 . If the barn yard space is 0.58 hectares, how long will it take for the number of chickens to be too big for the size of the yard? 3
- (iii) The area shown around the dam is now being considered as a possibility for expansion. How many extra chickens would it accommodate? 3



- (b) The following back to back stem & leaf plot shows the age at marriage of a randomly chosen sample of 71 married couples. The stem $2^{(0)}$ refers to ages from 20 to 24, $2^{(5)}$ refers to ages from 25 to 29.

Men		Women
	$2^{(0)}$	1 2 4 4 4 4 4
	$2^{(5)}$	5 6 6 6 6 6 6 7 7 7 8 8 9 9 9 9
4 4 3 3 2 2 2 1 1 0	$3^{(0)}$	0 0 0 0 1 1 2 3 3 3 3 4 4 4 4 4 4
9 9 8 8 8 8 8 8 7 7 7 5 5 5 5	$3^{(5)}$	5 5 5 6 7 7 8 8 8 9
4 4 3 3 3 3 3 2 2 2 1 1 1 1 0 0 0 0	$4^{(0)}$	0 1 1 1 1 1 1 2
9 9 9 8 8 8 7 7 6 6 5 5	$4^{(5)}$	5 5 8 9 9
4 3 2 2 1 1	$5^{(0)}$	
6 6 6 5	$5^{(5)}$	
2 1 0 0	$6^{(0)}$	1 1 1 2
	$6^{(5)}$	
	$7^{(0)}$	4
6	$7^{(5)}$	
	$8^{(0)}$	0

The questions referring to this data appear on the following page

Student Number:

Attach this page to your answer to question 28 (a)

Answer in the spaces provided.

- (i) Organise the data for
- men**
- into the frequency distribution table below

Marriage age for men Class	Class centre x	frequency f
30 - 34	32	
35 - 39	37	
40 - 44	42	
45 - 49	47	
50 - 54	52	
55 - 59	57	
60 - 64	62	
75 - 79	77	

1

- (ii) Use the frequency table in (i) to calculate the standard deviation to 1 decimal place and the Upper Quartile (to the nearest class centre) and so complete the table below.

2

	Men	Women
Mean	43.6	34.9
Standard deviation		10.6
Upper quartile		42
Median	42	32
Lower quartile	37	27

- (iii) Calculate the degree of skewness for each distribution using the formula

$$\text{Degree of skewness} = \frac{3 \times (\text{mean} - \text{median})}{\text{standard deviation}}$$

1

- (iv) Compare and contrast the two distributions with reference to central tendency, spread and skewness. Write your answer below

2

End of Examination

12.

Form 6 General Maths Trial Exam 2005.

1 1C 2B 3C 4D 5B 6B 7A 8C 9B 10B 11C
12C 13C 14A 15B 16D 17A 18D 19A 20D 21B 22B.

23a) Sail area = $\frac{1}{2} ab \sin C$
 $= \frac{1}{2} \times 5 \times 5 \times \sin 56^\circ \checkmark$
 $= 10.362... \checkmark$
 $= \underline{10 \text{ m}^2} \text{ (to } n \text{ m}^2)$

b)(i). Area = πab $a = \frac{1}{2} \times 2.0 = 1.0 \checkmark$
 $b = \frac{1}{2} \times 1.2 = 0.6 \checkmark$
 $= \pi \times 1 \times 0.6$
 $= 1.8849 \checkmark$
 $= \underline{1.9 \text{ m}^2} \text{ (2sf)}$

(ii) Volume = AH $H = 4 \text{ cm} = 0.04 \text{ m}$
 $= 1.88... \times 0.04 \checkmark$
 $= 0.075398...$
Weight = $0.075... \times 820 \text{ kg} \checkmark$
 $= 61.82... \text{ kg}$
 $= \underline{62 \text{ kg (2 s.f.)}}$

(c) $\angle THS = 15^\circ$ $\angle HST = 160^\circ$ $\angle SH = 5^\circ$

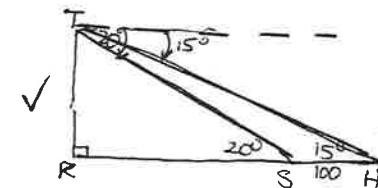
(i) In $\triangle TSH$, $\frac{100}{\sin 5^\circ} = \frac{ST}{\sin 15^\circ} \checkmark$
 $ST = \frac{100 \sin 15^\circ}{\sin 5^\circ} \checkmark$
 $= 296.961...$
 $= \underline{297 \text{ m (to } n \text{ m)}}$

(iii)

In $\triangle TRS$

$$\cos 20^\circ = \frac{RS}{296.961} \checkmark$$

$$RS = 296.961 \times \cos 20^\circ \checkmark$$



$$\text{Time taken for RH} = \frac{D}{S}$$

$$= \frac{0.37905}{10} \checkmark$$

$$= 0.037905 \text{ h}$$

$$= 2.274 \dots \text{ min}$$

$$\therefore \text{Total time} = 4 + 2.274 \checkmark$$

$$= 6 \text{ min (to n. min)}$$

24a)(i) Independent variable is the N° of Police, P. $\checkmark$

$$(ii) C = mP + b$$

$$m = \frac{235 - 250}{30 - 25}$$

$$= \frac{-15}{5}$$

$$= -3 \checkmark$$

$$C = mP + b$$

$$P=5, C=310$$

$$310 = -3 \times 5 + b$$

$$310 + 15 = b$$

$$b = 325 \checkmark$$

$$\therefore C = -3P + 325$$

(iii) The gradient is -3 and represents the rate drop in the number of crimes committed for each extra police person on duty. $\checkmark$

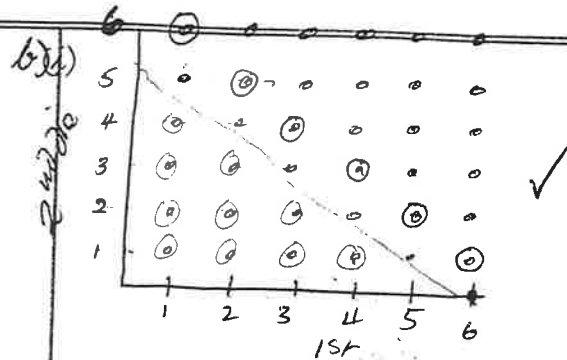
(iv) The vertical intercept is 325 and represents the no of crimes/work when there are no police.

$$(v) \text{ when } C=265, \quad 265 = -3P + 325$$

$$-60 = -3P$$

$$P = 20$$

$\therefore$ 20 Police on duty.



$$(ii) (A) P(\text{sum of 7}) = \frac{6}{36}$$

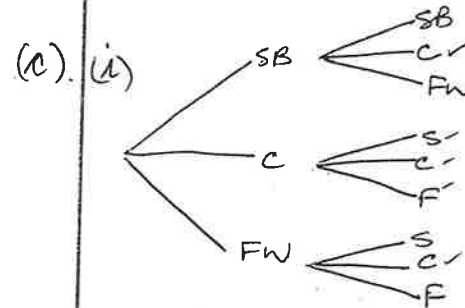
$$= \frac{1}{6} \checkmark$$

$$(B) P(\text{sum at least 6})$$

$$= 1 - P(\text{sum} < 6)$$

$$= 1 - \frac{10}{36}$$

$$= \frac{13}{18} \checkmark$$



$$(ii) P(C, C) = \frac{1}{9} \checkmark$$

$$(iii) P(\text{at least one cap}) = \frac{5}{9} \checkmark$$

$$25a) (i) \angle DC = 215 - 130$$

$$= 85^\circ \checkmark$$

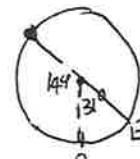
$$(ii) DC^2 = 52^2 + 78^2 - 2 \times 52 \times 78 \times \cos 85^\circ \checkmark$$

$$= 8080.99 \dots \checkmark$$

$$DC = 89.89 \dots$$

$$= 90 \text{ m (to n. m)} \checkmark$$

b)



$$(30^\circ \text{ N}, 149^\circ \text{ W})$$

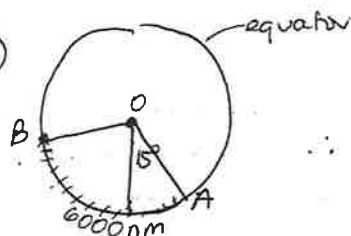
$$\checkmark \quad \checkmark$$

c) M(67°S, 63°E)
C(54°N, 63°E)

$$\text{Angular dist} = 67 + 54^\circ \\ = 121^\circ \checkmark$$

$$\text{Distance} = \frac{121}{360} \times 2\pi \times 6400 \text{ km} \checkmark \\ = 13515.829 \checkmark \\ = 14000 \text{ km (2sf).}$$

d) (i)



$$AB = 6000 \text{ nm}$$

$$1^\circ \text{ on gr circle} = 60 \text{ nm mile}$$

$$\therefore \text{Angular dist} = \frac{6000}{60} \\ = 100^\circ \checkmark$$

$$\angle AOB = 100^\circ$$

$$\therefore \text{Longitude of B is } 100 - 15 = 85^\circ \text{W.}$$

$$B (0^\circ, 85^\circ \text{W}). \checkmark$$

$$\text{(ii) Time difference} = 100^\circ \times \frac{24}{360} \quad 24 \text{ h} = 360^\circ$$

$$= 6 \text{ h } 40 \text{ min} \checkmark$$

$$\therefore \text{Time at B} = 5 \text{ pm} - 6 \text{ h } 40 \text{ min} \\ = 10:20 \text{ am} \checkmark$$

$$\begin{aligned} 26a) \text{ Future value} &= M \left\{ \frac{(1+r)^n - 1}{r} \right\} \checkmark \\ &= 1000 \left\{ \frac{(1 + \frac{0.084}{4})^{100} - 1}{\frac{0.084}{4}} \right\} \\ &= 1000 \times \left\{ \frac{1.021^{100} - 1}{0.021} \right\} \\ &= \$332881.17 \checkmark \end{aligned}$$

b)

$$S = 1200 - 200n$$

$$\text{(i) New cost} = \$1200 \checkmark$$

$$\text{(ii) Annual depreciation} = \$200 \checkmark$$

$$\text{(iii) Written off in 6 years.} \checkmark$$

(iv) Declining Balance method since the graph shows the decrease in value is more for the first 2 yrs. $\checkmark$

$$\text{(c) (i) } A = P(1+r)^n$$

$$r = \frac{0.06}{12} = 0.005 \checkmark$$

$$= 10000(1.005)^{60} \checkmark$$

$$= 13488.50$$

$$= \$13489 \text{ (to n.s.)}$$

$\therefore$ Harriet is owe $\$13489$ after 5 yrs.

(ii)

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

$$n = 3 \times 12 = 36$$

$$13489 = M \left\{ \frac{(1.005)^{36} - 1}{1.005^{36} \times 0.005} \right\}$$

$$= M \times 32.871 \dots$$

$$M = 13489 \div 32.871 \dots$$

$$= 410.346 \dots$$

$\therefore$ She repays $\$410.35$ a month

(iii)

$$\text{Total repaid} = \$410.35 \times 36 \\ = \underline{\underline{\$14772.60}} \checkmark$$

(iv)

$$\text{Interest} = 14772.60 - 10000 \\ = \underline{\underline{\$4772.60.}} \checkmark$$

7 a) (i) Plan width = $6.8 \text{ m} \div 250$
 $= 6800 \text{ mm} \div 250$
 $= 26 \text{ mm}.$

(ii) Area = $\frac{h}{2}(x+y)$
 $= \frac{16.25}{2}(10+30) \checkmark$
 $= 325 \text{ m}^2 \checkmark$

$h = 65 \times 250 \text{ mm} = 16250 \text{ mm}$
 $x = 40 \times 250 \text{ mm} = 10000 \text{ mm}$
 $y = 120 \times 250 \text{ mm} = 30000 \text{ mm}$

b) $h = 3 + 2t - t^2$

t	0	1	2	3	4
h	3	4	3	0	-5

(ii) Ball is released 3m above ground
 Edwina is standing above ground level because she is unlikely to be 3m tall.

(iii) Max height = 4m.

(iv) Kath catches ball 1m above ground.
 Quadratic model applies from $t=0$ to $t=2.75 \text{ sec}$
 approx (from graph)

(c) (i) $t \propto \frac{1}{s}$
 $t = \frac{k}{s}$ graph B (hyperbola)

(ii) when $t=15$, $s=5$
 $15 = \frac{k}{5}$
 $k = 75$
 $t = \frac{75}{s}$

when $s=2$

$t = \frac{75}{2}$
 $= 37\frac{1}{2} \text{ mins.}$

$\therefore$ Takes $37\frac{1}{2} \text{ min}$ when only 2 girls show up.

280 $C = 2500(1.7)^{0.2t}$

(i) $t=5$, $C = 2500 \times 1.7^{0.2 \times 5}$
 $= 4250.$

(ii) No of chickens = 2.5×5800
 $= 14500$

$0.58 \text{ ha} = 5800 \text{ m}^2$

$C = 2500 \times 1.7^{0.2t}$
 $14500 = 2500 \times 1.7^{0.2t}$

$5.8 = 1.7^{0.2t}$

$0.2t = \frac{\log 5.8}{\log 1.7}$
 $= 3.312..$

$t = \frac{3.312..}{0.2}$

$= 16.56..$

$\therefore$ It will take nearly 17 years.

(iii) Area = $\frac{h}{3}(d_f + 4d_m + d_l)$. use twice

$= \frac{30}{3}(76 + 4 \times 10 + 20) + \frac{30}{3}(14 + 4 \times 12 + 70)$
 $= 2680 \text{ m}^2$

No of extra chickens = 2680×2.5
 $= 6700$

Student Number:

Attach this page to your answer to question 28 (b)

Answer in the spaces provided.

- (i) Organise the data for men into the frequency distribution table below

Marriage age for men Class	Class centre x	frequency f
30 - 34	32	10
35 - 39	37	16
40 - 44	42	18
45 - 49	47	12
50 - 54	52	6
55 - 59	57	4
60 - 64	62	4
75 - 79	77	1

1

- (ii) Use the frequency table in (i) to calculate the standard deviation to 1 decimal place and the Upper Quartile (to the nearest class centre) and so complete the table below.

2

	Men	Women
Mean	43.6	34.9
Standard deviation	9.1 ✓	10.6
Upper quartile	47 ✓	42
Median	42	32
Lower quartile	37	27

- (iii) Calculate the degree of skewness for each distribution using the formula

$$\text{Degree of skewness} = \frac{3 \times (\text{mean} - \text{median})}{\text{standard deviation}}$$

$$\text{Men: skewness} = \frac{3 \times (43.6 - 42)}{9.1}$$

$$= 0.53 \text{ (2sf)} \times \frac{1}{2}$$

$$\text{Women: } \frac{3 \times (34.9 - 32)}{10.6}$$

$$= 0.82 \text{ (2sf)} \times \frac{1}{2}$$

- (iv) Compare and contrast the two distributions with reference to central tendency, spread and skewness. Write your answer below

2

The age of women at marriage is approximately 10 years younger than men as shown by the mean (8.7yrs) and median (10yrs). ✓

The spread of ages is lower for men as shown by the lower standard deviation and IQR. ✓

Both men and women are positively skewed (ie tend towards younger age) but women demonstrate more positive skew than men. ✓

Graph paper for Question 27 (b)

Only the top half is needed, the bottom half is spare.

