

Ascham



Name.....

2007

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 1 – 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 – 13)

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

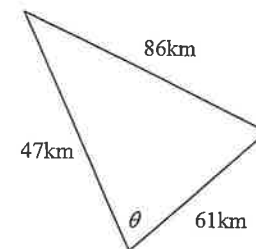
Section 1: Multiple Choice (22 Marks)

- At a shopping centre, a random sample of adult females were asked to give their shoe size. What type of data is this?
A. Continuous B. Categorical C. Discrete D. Stratified
- If a motorbike travels a distance of 230 km using 11 litres of petrol, what is its fuel consumption in litres per 100 km correct to two decimal places?
A. 4.57 litres B. 4.78 litres C. 25.31 litres D. 20.91 litres
- The total repayments for a \$60000 loan on a flat rate interest of 7.5% p.a. over a 5 year period are:
A. \$4500 B. \$22500 C. \$82500 D. \$37.50
- In which of the following data sets is the mode, median and mean all equal?
A. 1, 1, 2, 3, 3 B. 1, 1, 1, 2 C. 3, 4, 4, 5 D. 8, 10, 12
- The surface area of a sphere is given by the formula $S = 4\pi r^2$, where r is the radius of the sphere. The diameter of a sphere is 12 cm. The surface area of this sphere is:
A. 452.4 cm^2 B. 5684.9 cm^2 C. 22739.6 cm^2 D. 2812.9 cm^2
- What percentage of scores are greater than 6?

Score	Frequency
3	4
4	5
5	4
6	3
7	6
8	3

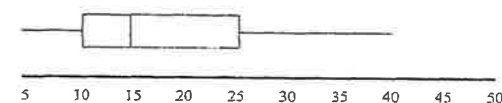
- A. 9% B. 12% C. 36% D. 48%

7. The size of the angle marked θ is closest to

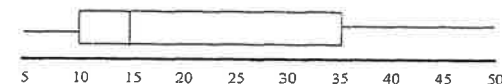


- A. 75° B. 105° C. 43° D. 32°
8. Which one of the following box-and-whisker plots shows an interquartile range of 35 and a median of 15?

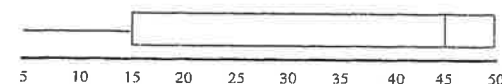
A.



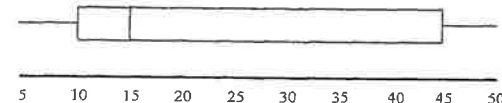
B.



C.

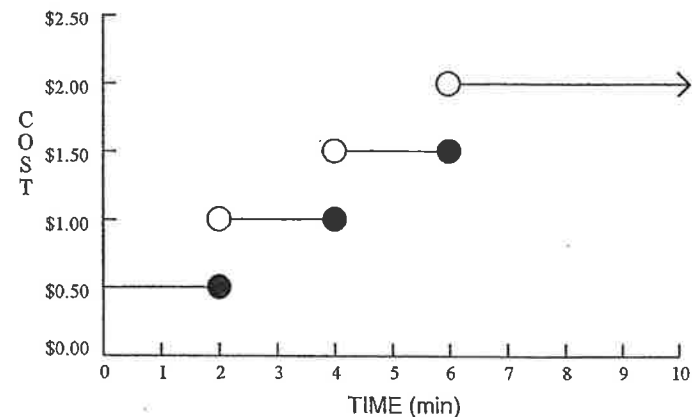


D.



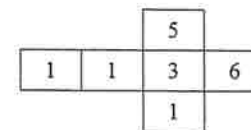
9. Ellie earns \$600 per week. Her monthly pay is closest to:
- A. \$2100 B. \$2400 C. \$2600 D. \$2700
10. Simplify $4n - 5n^2 + 7 - 9n + 1$
- A. $5n^2 - 13n + 8$ B. $8 - 5n - 5n^2$ C. $8 - 10n^2$ D. $-2n^2$
11. Two points on the surface of the Earth are J(15°N , 60°W) and K(45°S , 60°E). Which of the following statements about the time difference between M and N is true?
- A J is 4 hours behind K
 B J is 4 hours ahead of K
 C J is 8 hours behind K
 D J is 8 hours ahead of K
12. The time for a team of 5 workers to construct a house is 20 days. How long will it take for a team of 25 workers to complete the same house working at the same rate?
- A. 125 days B. 100 days C. 5 days D. 4 days
13. In a certain test, the results of six students were:
- 63 38 94 73 59 64**
- After further revision, the test was repeated and every student's mark increased by 5. When comparing the second set of results with the first :
- A The mean had increased by 5 and the standard deviation remained the same.
 B The mean had decreased by 5 and the standard deviation remained the same.
 C The mean had increased by 5 and the standard deviation increased by 5.
 D The mean had decreased by 5 and the standard deviation increased by 5.
14. The Giaconda Medical Products Company declares an after tax profit of \$482 500, all of which is to be distributed in dividends. If the Company has 277 400 shares issued with a current market share price of \$24.00, what is the dividend yield?
- A. 0.07% B. \$1.74 C. 7.2% D. \$17.39

15. \$10000 invested at 9% per annum with interest compounding quarterly for 5 years will grow to:
- A. $10000(1.09)^5$ B. $10000(1.045)^{10}$ C. $10000(1.0225)^{20}$ D. $10000(1.0075)^{60}$
16. The graph below shows the cost of a timed telephone call.



Lucy makes two calls to a friend of length 4 minutes and 6 minutes. How much cheaper would it have been for Lucy to make a single 10 minute call?

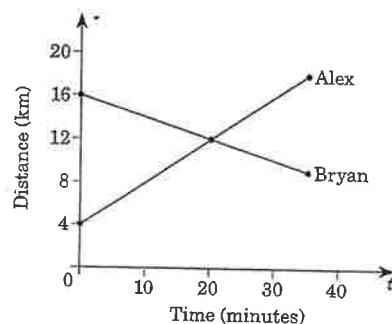
- A. \$0.50 B. \$1.00 C. \$1.50 D. \$2.00
17. The figure below is the net of a die.



Which of the following statements is **incorrect**?

- A The number 6 is less likely to be rolled than any other number.
 B The probability of rolling a 1 is $\frac{1}{2}$.
 C The number 1 is the most likely number to be rolled.
 D There is an equal chance of rolling a 3 or a 5.

18. At the same time, Alex and Bryan start riding towards each other along a road. The graph shows their distances (in kilometers) from town after t minutes.



How many kilometers has Alex traveled when they meet?

- A. 4 B. 8 C. 12 D. 20

19. Two groups of people are compared on the amount of weight each person had lost (in kg) after following two different diet plans for a period of 10 weeks. Group A followed a Low Fat Diet and Group B followed a Low Carbohydrate Diet. The results for the groups are shown on the back-to-back stem-and-leaf plot below.

Group A		Group B
9 7 6 4 3 2 1	0	6 6 7 9
9 8 7 5 2	1	1 2 2 2 5 7 9
5 2 1	2	2 4 8
	3	0

Which ONE of the following statements is true?

- A. The two groups had the same median and the same range.
 B. The two groups had the same median, but Group B had the higher range.
 C. The two groups had the same range, but Group B had the higher median.
 D. Group B had a higher range and higher median.

20. The graph of $y = -x + 7$ passes through the point:

- A. (0,7) B. (-1,7) C. (4,11) D. (4,-11)

21. How many different 8 digit phone numbers can be formed if digits are allowed to be repeated and the first digit must be a 9.

- A. 9×10^8 B. 9×10^7 C. 1×10^8 D. 1×10^7

22. Brad and Janet wish to purchase an annuity for their grandson to cover his high school fees. The fees are expected to be \$20 000 each year and he will be in high school for six years. They have chosen an annuity with an interest rate of 6.8% compounding annually. What amount do they need to invest today if the first of the six school fee payments will be due in one year's time?

- A. \$120 000 B. \$95 922 C. \$211 239 D. \$142 346

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

Question 23 (13 marks)

- a) What would be the measurement error and the percentage error in a measurement of 9.4 metres? [2]

- b) The field book record below shows the measurements (in metres) taken from a paddock.

		D	
	130		
	110	60	C
	75	90	B
E 60	20		
	0		
	A		

- i) Use these entries to draw a neat sketch of the paddock. Mark the interval and offset distances on the sketch. [1]

- ii) Calculate the area of the paddock. [2]

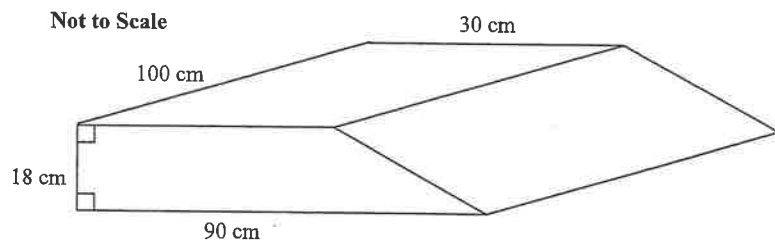
- iii) A gate is to be placed at CB. How wide is the gate at CB, to the nearest metre? [2]

- c) Matilda measures the area of her bathroom to be 6 m^2 .

- i) Determine the area of Matilda's bathroom in cm^2 . [1]

- ii) How many 7 cm by 7 cm tiles would fit on Matilda's bathroom floor with an area of 6 m^2 . [1]

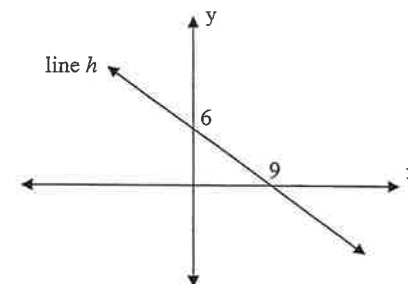
- d) The following trapezoidal prism is a diagram of a Chef 2000 rangehood fan system.



- i) Determine the cross sectional area of this rangehood. [1]

- ii) Find the volume of the rangehood. [1]

- e) The line h is drawn on the number plane below.

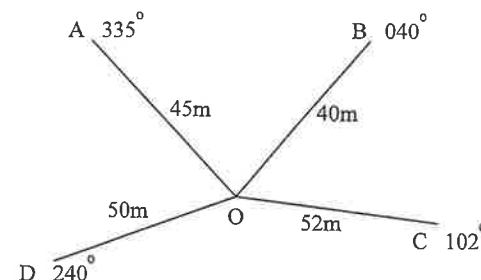


Determine the equation of the line h .

[2]

Question 24 (13 marks)

- a) An orienteering group stood at O and took sightings on 4 landmarks and marked the bearings and distances shown in the diagram below.



- i) Find the size of angle COD [1]

- ii) Find the size of angle AOB [1]

- iii) Find the distance CD correct to the nearest metre [2]

- iv) Find the area of triangle AOB correct to 4 significant figures. [2]

- b) The formula for calculating the bend allowance in sheet metal is

$$B = 2\pi \left(R + \frac{T}{2} \right) \times \frac{A}{360}, \text{ where } B \text{ is the bend allowance, } T \text{ is the thickness in mm,}$$

A is the number of degrees in the angle of the bend, and R is the radius of curvature in mm.

Determine the bend allowance of a piece of sheet metal 6 mm thick when the radius of curvature is 15 mm at an angle of 75° . [2]

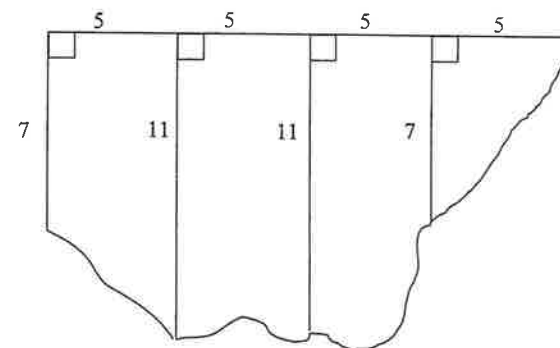
- c) A Scientist at Homebush Bay has recently captured and tagged 20 yellow belly frogs. Some weeks later the Scientist captured 50 yellow belly frogs of which 8 were tagged. Show working to calculate the approximate size of the yellow belly frog population at Homebush Bay. [2]
- d) Rebecca purchased a new small car for \$21 000. The NRMA believes this small car will depreciate by \$1 500 per annum.
- Find the value of the small car after 4 years. [1]
 - How many years will it take the car to have a salvage value of zero? [2]

Question 25 (13 marks)

- a) A 6 character password for an internet banking account is from the digits 0 to 9 or any of the 26 letters of the alphabet. It is not case sensitive (ie there is no difference between A and a).
- How many passwords are possible with no restrictions? [2]
 - Find the probability of a hacker cracking the password in one attempt. [1]
- b) Calculate the single amount of money to be deposited to provide for an annuity of \$2 000 paid at the end of each year for 10 years, if the rate of interest is 8 % pa. Give your answer correct to the nearest dollar. [3]
- c) Luigi invests \$15 000 in a bank for 5 years. After the 5 years he earns \$4 200 interest. Find the simple interest rate he received, correct to two decimal places [2]
- d) Given $E = mc^2$, find the value of c , if $E = 6\,895$ and $m = 0.00064$. Give answer in scientific notation, correct to 3 significant figures. [2]
- e) Write a sentence to describe an event with a probability of zero. [1]
- f) At least how many years will it take Annabelle to double her investment of \$5000, if she receives an interest rate of 6 % p.a. compounded semi-annually (ie every 6 months) ? [2]

Question 26 (13 marks)

- a) A river has a cross-section as shown below, with measurements in metres.



- Calculate the area of the cross-section using Simpson's rule. [2]
 - If the river is 45m deep, calculate the volume of water in the river given that $1m^3 = 1000L$. [1]
- b) Lucy and Emma are planning an African safari holiday in 2 years time. They need \$9000 for the trip.
- To save this money they will make monthly contributions into a savings account with an interest rate of 4.5% p.a. compounding monthly.
- Calculate the amount of money Lucy and Emma must put into the account at the end of each month for 2 years so they will have enough money to pay for the holiday? [3]
 - How much interest will they earn over the 2 years? [2]

- c) A group of science students performed an experiment to determine the relationship between the speed (s) of an object at various times (t).

The results are recorded in the table below :

t	1	2	3	4	5
s	5.5	9	12	16	19.5

Using the results in the table to answer the following questions.

- Plot the co-ordinates on the graph paper provided, and draw a line of best fit. [2]
- Use your line of best fit to estimate the speed, when the time $t = 6$ seconds. [1]
- What is the starting speed of the object? [1]
- Determine the equation of the line drawn in part (i). [1]

Question 27 (13 marks)

- a) Mr Brown has 2 Year 11 Maths classes. He keeps their results for a test out of 50 as shown below.
- Class 11MG1 34, 35, 23, 9, 21, 43, 29, 32, 32, 45, 50, 49, 12, 28, 48
- Class 11MG2 43, 32, 50, 22, 8, 16, 33, 42, 28, 22, 16, 19, 9, 33, 44
- Write down the range of marks for Class 11MG1 and 11MG2. [2]
 - Write down the median mark for Class 11MG1 and 11MG2. [2]
 - For each class draw a box-and-whiskers plot to show the comparative marks. [4]
 - These results could have been put on a double stem-and-leaf plot. Explain two differences between a box-and-whiskers and a stem-and-leaf plot in comparing the classes. [2]

- b) The results of a Science class in a test are shown in the following Stem-and-leaf plot.

Stem	Scores of the Class			
2	8			
3	7			
4	4			
5	3			
6	6	7		
7	3	7		
8	4	5	9	
9	1	2	6	7 8 8

- How many students completed the Science test? [1]
- Calculate the population standard deviation and the mean of the science test. Correct to two decimal places if necessary. [2]

Question 28 (13 marks)

- a) Guangzhou, China has latitude and longitude coordinates (23°N, 121°E) and Los Angeles, USA has coordinates (23°N, 119°W).
- What is the angular distance in degrees between Guangzhou and Los Angeles? [1]
 - What is the local time and day in Los Angeles USA when it is 1.30pm Wednesday in Guangzhou China? [2]
- b) Max plans to invest \$10 000 for three years. He is choosing between two options:
- Option A:** 7.9% p.a. compounded annually for 3 years.
- Option B:** 7.5% p.a. compounded monthly for 3 years.
- Calculate the value of the investment at the end of three years under each option. [3]
 - Which investment option should he choose? Give a reason for your answer. [2]

- c) The pressure, P , of a given mass of gas in a closed cylinder varies inversely with the square root of the volume, V , of the cylinder.

If a cylinder of volume 10000cm^3 has a pressure of 80 units, find

- The equation connecting V and P .
- The pressure when the volume is 1600cm^3 .
- The volume of the cylinder, to the nearest cubic centimetre, when the pressure inside the cylinder is 25 units.

[3]

[1]

[1]

END OF EXAM

① C Discrete

② $\frac{11}{230} \times 100 = 4.781$

B

③ $I = Prn$
 $= 60000 \times 0.075 \times 5$
 $= 22500$
 total = $I + P$
 $= 22500 + 60000$
 $= \$82500$

④

	mode	median	mean
A	1, 3	2	2
B	1	1	1.25
C	4	4	4 ←
D	8, 10, 12	10	10

C

⑤ diameter = 12
 radius = 6
 $S = 4\pi r^2$
 $= 4\pi \times 6^2$
 $= 452.4$

A

⑥ sum of $f = 4 + 5 + 4 + 3 + 6 + 3$
 $= 25$
 f of scores greater than 6
 $= 6 + 3$
 $= 9$
 $\%$ of scores greater than 6
 $= \frac{9}{25}$
 $= 36\%$

C

⑦ $\cos A = \frac{61^2 + 47^2 - 86^2}{2 \times 61 \times 47}$
 $= -0.2556677956$
 $A = 105^\circ$

B

⑧ D $45 - 10 = 35 = 1QR$
 $15 = \text{median}$

⑨ $\frac{\$600 \times 52}{12} = 2600$

C

⑩ $4n - 5n^2 + 7 - 9n + 1 = 8 - 5n - 5n^2$

B

⑪ $60^\circ + 60^\circ = 120^\circ$
 $\frac{120^\circ}{15^\circ} = 8 \text{ hours time diff}$

E is ahead of W
 $\therefore J$ is behind K by 8 hours

C

⑫ 5 workers take 20 days
 1 worker takes $20 \times 5 = 100$ days
 25 workers take $\frac{100}{25} = 4$ days

D

⑬ A

⑭ dividend = $\frac{\$82500}{277400}$
 per share

$= \$1.74 \text{ per share}$

dividend yield = $\frac{\text{dividend per share}}{\text{share price}} \times 100$
 $= \frac{\$1.74}{\$24} \times 100$
 $= 7.247\%$

C

$$(15) 10000 \left(1 + \frac{0.09}{4}\right)^{5 \times 4}$$

$$= 10000(1.0225)^{20}$$

C

$$(16) \begin{array}{l} 4 \text{ min costs } \$1.75 = \$2.50 \\ 6 \text{ min costs } \$1.50 \\ 10 \text{ min costs } \$2.00 \end{array}$$

$$\$2.50 - \$2.00 = 50¢ \text{ cheaper}$$

A

$$(17) \begin{array}{l} B \text{ is true } \frac{3}{6} = \frac{1}{2} \\ C \text{ is true } \\ D \text{ is true } P(3) = \frac{1}{6} = P(5) = \frac{1}{6} \end{array}$$

A

$$(18) \text{ Alex went from 4 to 12.} \\ \text{ie } 12 - 4 = 8 \text{ km}$$

B

	range	median
Group A	$25 - 1 = 24$	12
Group B	$30 - 6 = 24$	12

A

$$(20) \begin{array}{l} (0, 7) \\ y = -0 + 7 \\ y = 7 \end{array}$$

A

$$(21) \underbrace{1 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10 \times 10}_{10^7} = 1 \times 10^7$$

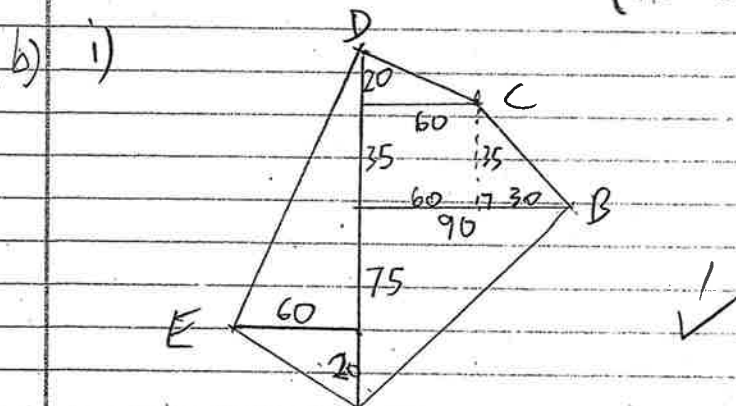
D

$$(22) N = M \left[\frac{(1+r)^n - 1}{r(1+r)^n} \right] \\ = 20000 \left[\frac{(1.068)^6 - 1}{0.068(1.068)^6} \right] \\ = \$95922.25$$

B

Question 23

a) measurement error = $0.1m \div 2$
 $= 0.05m$ ✓
 percentage error = $\frac{0.05}{9.4} \times 100$
 $= 0.53\%$ ✓
 (to 2 dec pl)



ii) Area = $\frac{1}{2} \times 60 \times 130 + \frac{1}{2} \times 60 \times 20 + \frac{1}{2} \times 90 \times 75$
 $+ \frac{1}{2} \times 35(60+90)$ ✓
 $= 10500m^2$ ✓

iii) $CB^2 = 30^2 + 35^2$ ✓
 $= 900 + 1225$
 $= 2125$
 $CB = 46m$ (to nearest whole m) ✓

c) i) $1m = 100cm$
 $1m^2 = 100 \times 100 cm^2$
 $= 10000 cm^2$

Area of bathroom = $60000 cm^2$ ✓

ii) Area of tile = $7 \times 7 = 49 cm^2$

no. of tiles = $\frac{60000 cm^2}{49 cm^2}$

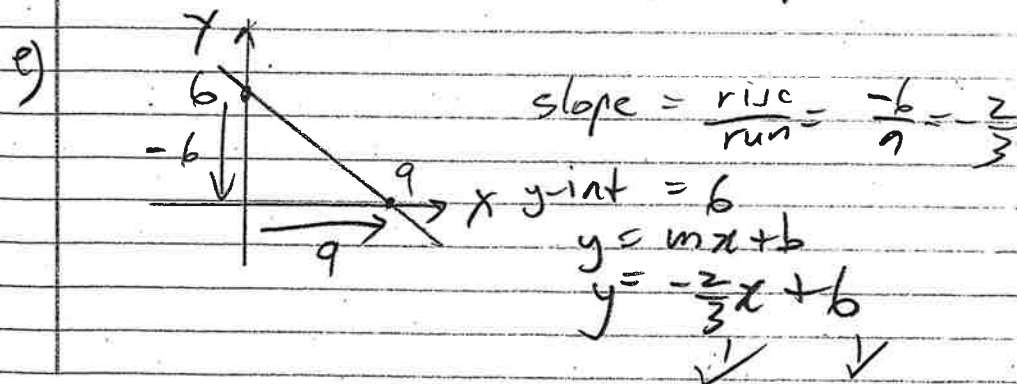
$= 1224.5$ tiles ✓
 (to 1 dec pl)

d) i) cross-sectional area

$= \frac{1}{2} h(a+b)$
 $= \frac{1}{2} \times 18(30+90)$ ✓
 $= 1080 cm^2$ ✓

ii) Volume = Ah

$= 1080 \times 100$ ✓
 $= 108000 cm^3$ ✓



c) % of pop. tagged

$$= \frac{8}{50} \times 100 = 16\% \checkmark$$

$$16\% \text{ of pop} = 20$$

$$1\% \text{ of pop} = \frac{20}{16}$$

$$100\% \text{ of pop} = \frac{20}{16} \times 100 \\ = 125 \checkmark$$

$$d) i) S = V_0 - Dn$$

$$S = 21000 - 1500 \times 4 \\ = \$15000 \checkmark$$

$$ii) 0 = 21000 - 1500 \times n \checkmark$$

$$1500 \times n = 21000$$

$$n = \frac{21000}{1500}$$

$$= 14 \text{ years} \checkmark$$

Q 24

$$a) i) \angle COD = 240 - 102 \\ = 138^\circ \checkmark$$

$$ii) \angle AOB = (360 - 335) + 40 \\ = 25 + 40 \checkmark \\ = 65^\circ$$

$$iii) a^2 = b^2 + c^2 - 2bc \cos A \\ CD^2 = 52^2 + 50^2 - 2 \times 52 \times 50 \cos 138^\circ \checkmark \\ = 9068 \\ CD = 95 \text{ m } \checkmark (\text{nearest m})$$

$$iv) \text{Area} = \frac{1}{2} ab \sin C \\ = \frac{1}{2} \times 40 \times 45 \times \sin 65^\circ \checkmark \\ = 815.7 \text{ m}^2 \checkmark (4 \text{ sig figs})$$

$$b) B = 2\pi \left(R + \frac{I}{2} \right) \times \frac{A}{360^\circ} \\ = 2\pi \left(15 + \frac{6}{2} \right) \times \frac{75}{360^\circ} \checkmark \\ = 23.56 \text{ mm} (4 \text{ sig figs}) \checkmark$$

c)

Q 25

$$a) i) 36 \times 36 \times 36 \times 36 \times 36 \times 36 = 36^6 \downarrow$$

$$= 2176782336$$

$$ii) P(\text{carking}) = \frac{1}{36^6} \downarrow$$

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

$$N = 2000 \left[\frac{(1.08)^{10} - 1}{0.08(1.08)^{10}} \right] \downarrow$$

$$= \$13420.16 \downarrow$$

$$c) SI = P/rn$$

$$4200 = 15000 \times r \times 5 \downarrow$$

$$4200 = 75000r$$

$$\frac{4200}{75000} = 0.056$$

$$\therefore \text{interest rate} = 5.6\% \text{ pa.} \downarrow$$

$$d) 6895 = 0.00064 \times c^2 \downarrow$$

$$\frac{6895}{0.00064} = c^2$$

$$c^2 = 10773437.5$$

$$c = 3282.29 \downarrow$$

$$= 3.28 \times 10^3 \downarrow$$

e) tossing a head and tail simultaneously
-ly. $\downarrow$

$$f) r = \frac{0.06}{2} = 0.03$$

$$n = \text{no. of months.}$$

$$A = 10000$$

$$P = 5000$$

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

$$10000 = 5000 (1.03)^n \downarrow$$

$$\frac{10000}{5000} = (1.03)^n$$

$$2 = (1.03)^n$$

$$\text{guess and check} \Rightarrow n = 23.44 \dots$$

Half year

$$\therefore 11.7 \text{ years.}$$

$$\text{or } 12 \text{ years to nearest whole years} \downarrow$$

Q26

a) i) $A = A_1 + A_2$

$$A_1 = \frac{h}{3} [d_f + 4d_m + d_c], A_2 = \frac{h}{3} [d_f + 4d_m + d_c]$$

$$A = \frac{5}{3} [7 + 4 \times 11 + 11] + \frac{5}{3} [11 + 4 \times 7 + 0] \checkmark$$

$$= \frac{5}{3} \times 62 + \frac{5}{3} \times 39$$

$$= 168\frac{1}{3} \text{ m}^2 \checkmark$$

ii) $V = Ah$

$$= 168\frac{1}{3} \times 45$$

$$= 7575 \text{ m}^3$$

$$= 7575000 \text{ L} \checkmark$$

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

$$A = 9000$$

$$r = \frac{0.045}{12} = 0.00375$$

$$n = 2 \times 12 = 24 \text{ mths}$$

$$9000 = M \left[\frac{(1.00375)^{24} - 1}{0.00375} \right] \checkmark$$

$$9000 = M \times 25.06403136$$

$$\frac{9000}{25.064} = M$$

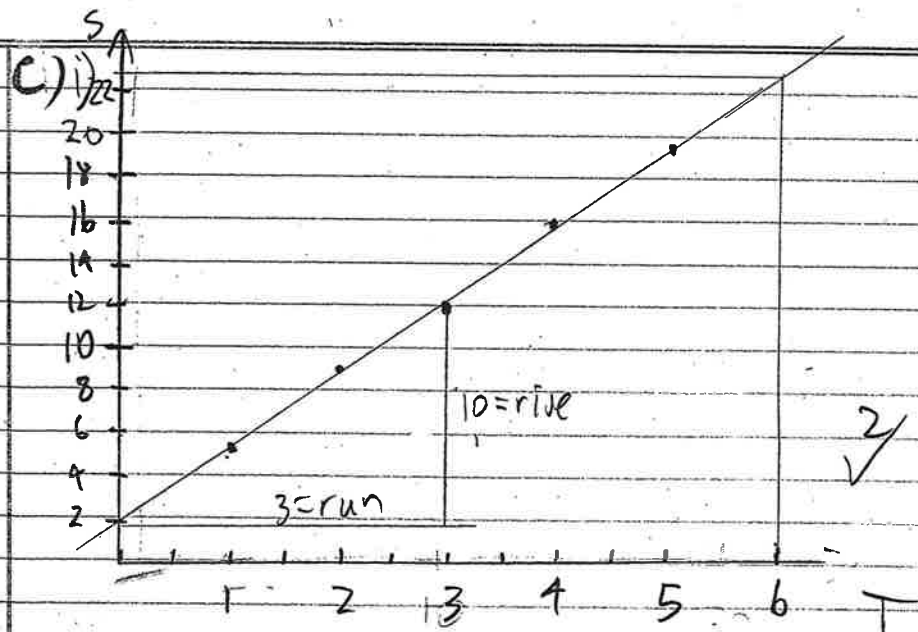
$$M = 359.080304 \checkmark$$

$$= \$359.09$$

ii) $359.09 \times 24 = \text{total contributions} \checkmark$

$$= \$8617.93$$

$$\text{interest} = 9000 - 8617.93 = \$382.87 \checkmark$$



ii) $s = 23 \text{ m/s} \checkmark$

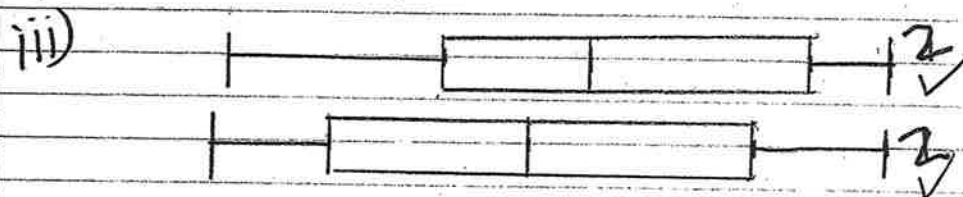
iii) starting speed = $2 \text{ m/s} \checkmark$

iv) $s = \frac{10}{3}t + 2 \checkmark$

Q27

- a) (i) MMb1 range = $50 - 9 = 41$ ✓
MMb2 range = $50 - 8 = 42$ ✓

- ii) MMb1 median = 32 ✓
MMb2 median = 28 ✓



<u>MMb1</u>	L	Q ₁	Med.	Q ₃	H
<u>MMb1</u>	9	23	32	45	50
<u>MMb2</u>	8	16	28	42	50

- iv) B&W show IQR explicitly and median. ✓
 Stem and leaf do not. ✓
 Stem & leaf show all data. ✓
 B&W does not. ✓

- b) i) 17 ✓

- ii) mean = 75 ✓

std dev = $\frac{21.90}{\sqrt{2.45}}$ ✓
 (2 dec pl.)

Q28

- a) i) angular distance = $119^\circ + 121^\circ = 240^\circ$ ✓

ii) $\frac{240^\circ}{15^\circ} = 16$ hours

Wed. 13:30 - 16 hours

Tue 21:30 i.e. 9:30 pm. Tue. ✓

b) (i) A
 $r = 0.079$ $n = 3$ ✓
 $A = 10000(1.079)^3$ ✓
 $= \$12562.16$ ✓

B
 $r = \frac{0.075}{12}$, $n = 12 \times 3$ ✓
 $A = 10000(1 + \frac{0.075}{12})^{12}$ ✓
 $= \$12514.46$ ✓

- ii) A Since it gives a higher return. ✓

c) i) $P = \frac{k}{\sqrt{V}}$ ✓

$80 = \frac{k}{\sqrt{10000}}$ ✓
 $\therefore k = 80 \times 100 = 8000$ ✓

$P = \frac{8000}{\sqrt{V}}$ ✓

$$\text{ii) } P = \frac{8000}{\sqrt{V}}$$

$$= \frac{8000}{\sqrt{1600}}$$

$$= \frac{8000}{40}$$

$$= 200 \text{ units } \checkmark$$

$$\text{iii) } 25 = \frac{8000}{\sqrt{V}}$$

$$\sqrt{V} = \frac{8000}{25}$$

$$\sqrt{V} = 320$$

$$V = 320^2$$

$$V = 102400 \text{ cm}^3 \checkmark$$