Barker College

General Mathematics

ANSWER SHEET

Staff Involved:

THURSDAY 4ᵗʰ AUGUST

- TE*   • JMS
- AJD* • JML
- JWH   • JXA
- VAB

160 copies

Section I – Multiple Choice

Choose the best response and fill in the response oval completely

_____

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

12.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
13.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
14.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
15.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
16.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
17.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
18.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
19.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
20.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
21.	Ⓐ	Ⓑ	Ⓒ	Ⓓ
22.	Ⓐ	Ⓑ	Ⓒ	Ⓓ

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Barker College

2011
TRIAL
HIGHER SCHOOL
CERTIFICATE

General Mathematics

Staff Involved:

THURSDAY 4th AUGUST

- **TE***   - **JMS**
- **AJD***   - **JML**
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160 copies

General Instructions

- Working time – 2 hours 30 minutes

- Write using blue or black pen

- Make sure your Barker Student Number is on ALL answer pages handed in

- Approved calculators, graphic calculators and templates may be used

- Marks may be deducted for careless or poorly arranged work

- A Mathematical Formulae Sheet on pages 25-26 is provided for your general use

Total marks – 100

| Section I | Pages 4 – 11

22 marks

- Attempt Questions 1 – 22

- Allow about 30 minutes for this section

- Answer this section on the Answer Sheet provided

| Section II | Pages 12 – 24

78 marks

- Attempt Questions 23 – 28

- Show ALL necessary working

- Allow approximately 2 hours for this section

- Answer this section on the separate lined paper provided

SECTION I

22 marks

Attempt Questions 1 – 22

Use the multiple-choice answer sheet

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

Sample 2 + 4 = (A) 2 (B) 6 (C) 8 (D) 9

(A) ⬯ (B) ⬤ (C) ⬯ (D) ⬯

If you think you have made a mistake, put a cross through the incorrect answer and fill in the new answer.

(A) ⬤ (B) ⊗ (C) ⬯ (D) ⬯

If you change your mind and have crossed out what you consider to be the correct answer, then indicate this by writing the word *correct* and drawing an arrow as follows.
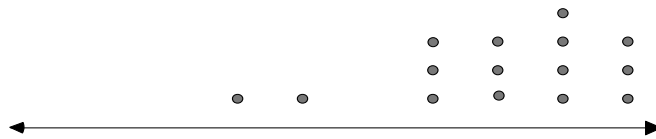
correct

(A) ⊗ (B) ⊗ (C) ⬯ (D) ⬯

_____

4

1. Simplify $16 - 4(x - 2)$.
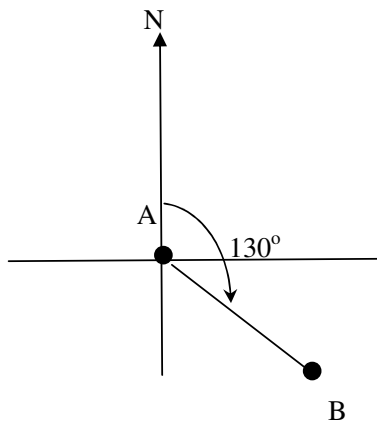
(A) $8 - 4x$ (B) $24 - 4x$ (C) $12x - 8$ (D) $12x - 24$

2. The results of a survey are displayed in a dot plot. Describe the data.

(A)   Bell-shaped

(B)   Normally distributed

(C)   Negatively skewed

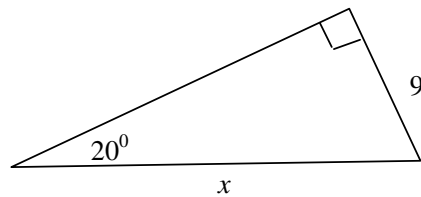(D)   Positively skewed

3. A plane flies on a bearing of 130° from A to B.

What is the bearing of A from B?

(A) 30° (B) 50° (C) 230° (D) 310°

4. If $N = -6$, what is the value of $\dfrac{N^2 - 3N}{4}$?

(A) 40.5 (B) 13.5 (C) 1.5 (D) -4.5

5. Which is the correct expression for the value of x in this triangle?

9   NOT TO SCALE

20^0

x

(A) $9\sin 20^0$

(B) $9\cos 20^0$

(C) $9\tan 20^0$

(D) $\dfrac{9}{\sin 20^0}$

6. In a trial of a test to detect swine flu, 150 people are tested and the results are summarised in the table below.

|	Test indicated swine flu	Test did not indicate swine flu
People with swine flu	23	7
People without swine flu	5	115
Total	28	122

For what percentage of the people tested was the test inaccurate?

(A) 8% (B) 9.8% (C) 90.2% (D) 92%

7. Jodie earns $3 870 per month. Calculate her annual salary if she is given a 2.5% pay rise.

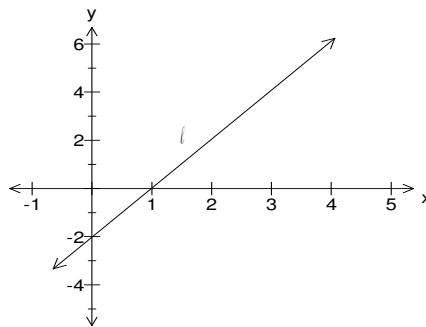(A) $ 3 966.75   (B) $ 4 644   (C) $ 46 440   (D) $47 601

8. The results on a test gained by the students in two classes A and B are shown below:
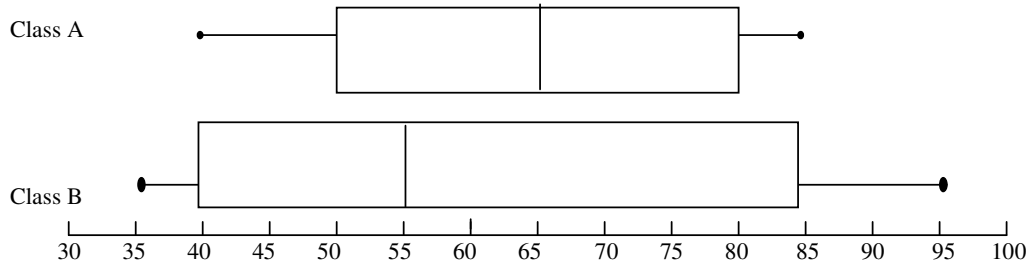
The difference between the medians for Class A and Class B is

(A)   10   (B)   15   (C)   30   (D)   45

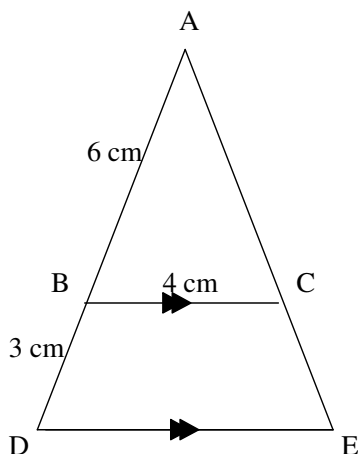**9.** What is the equation of the line l ?

(A) $y = 2x + 1$
(B) $y = 2x - 2$
(C) $y = -2x + 1$
(D) $y = -2x - 2$

10. Two dice are rolled. What is probability that **only one** of the dice shows a six?

(A) $\dfrac{5}{36}$ (B) $\dfrac{1}{36}$ (C) $\dfrac{1}{6}$ (D) $\dfrac{5}{18}$

11.

NOT TO SCALE

Triangles ABC and ADE drawn above are similar.

Given BC is parallel to DE, AB = 6 cm, BC = 4 cm, BD = 3 cm, find the length of DE.

(A) 2 cm   (B) 5 cm   (C) 6 cm   (D) 8 cm

12. Tim has 400 XYZ shares with a current market value of $2.80 each. During the past year he has received a total dividend of $160.
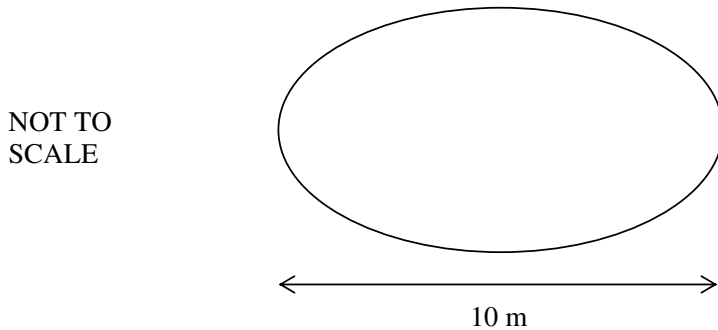
What is the current dividend yield on these shares, correct to one decimal place?

(A) 0.4%   (B) 1.8%   (C) 7.0%   (D) 14.3%

13. John invests $5000 for 1 year and 4 months. The simple interest rate is 6% per annum.

What is the total value of the investment at the end of this period?

(A) $400   (B) $420   (C) $5400   (D) $5420

14. The following ellipse has an area of $60m^2$.

NOT TO SCALE

10 m

The length of the semi-minor axis correct to two decimal places is

(A) 3.81 m   (B) 3.82 m   (C) 1.90 m   (D) 1.91 m

15. Change $a = \dfrac{n + x^2}{4}$ to make n the subject.

(A) $n = \dfrac{4a}{x^2}$

(B) $n = 4a - x^2$

(C) $n = \dfrac{a + x^2}{4}$

(D) $n = 4(a - x^2)$

16. The student population for a senior high school is shown below.

| Year	Number of Students
10	210
11	195
12	235

Graham needs to survey 80 of the students. If he decides to take a stratified sample how many students from year 12 should he include in his survey?

(A) 23   (B) 27   (C) 29   (D) 78

17. Anne measures the length of a piece of material for a quilt using a tape measure which is labelled in centimetres, but also has markings every half centimetre. She measures the length as 125cm. The percentage error in this measurement is

(A)   0.8%   (B)   0.2%   (C)   0.4%   (D)   40%

18.   This is a sketch of a sector of a circle.

7 cm   NOT TO
              SCALE
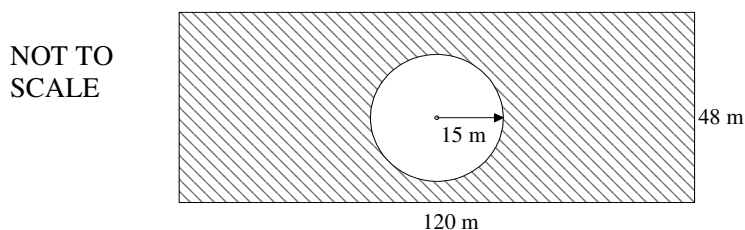
θ
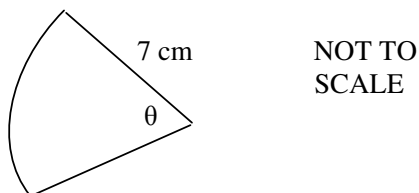
If the area of this sector is 32 cm^2, find the angle θ to the nearest degree.

(A)   5°   (B)   10°   (C) 75°   (D)   262°

19.   Which is not true of the following set of scores?

Score	Frequency
12	3
13	9
14	5
15	5
16	3
Total	25

(A)   The mean is 13.84.

(B)   The mode is 13.

(C)   The range is 4.

(D)   The median is 13

20.   Calculate the shaded area shown below correct to **2 significant figures**.

NOT TO
SCALE

15 m

48 m

120 m

(A)   5000 m^2 (B)   5053 m^2 (C) 5100 m^2 (D) 5050 m^2

21. Mr Lee took out a car loan for $25 000 at 12% p.a. interest, compounding monthly over 5 years. The amount of each monthly repayment can be found using
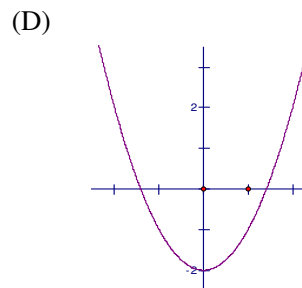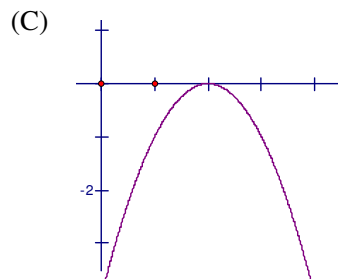
(A) $M = 25000 \div \left\{ \dfrac{1 \cdot 01^5 - 1}{0 \cdot 01^5 - 1 \cdot 01^5} \right\}$

(B) $M = 25000 \times \left\{ \dfrac{0 \cdot 01 \times 1 \cdot 01^{60}}{1 \cdot 01^{60} - 1} \right\}$

(C) $M = 25000 \times \left\{ \dfrac{0 \cdot 12 \times 1 \cdot 12^5}{1 \cdot 12^5 - 1} \right\}$

(D) $M = 25000 \div \left\{ \dfrac{0 \cdot 12 \times 1 \cdot 12^{60}}{1 \cdot 12^{60} - 1} \right\}$

22. Which of the following graphs could represent $y = 2 - x^2$?

(A)

(B)

(C)

(D)

End of Section I

11
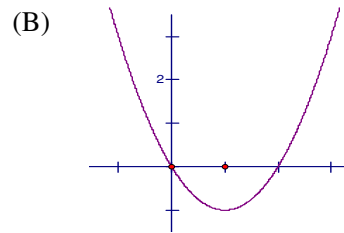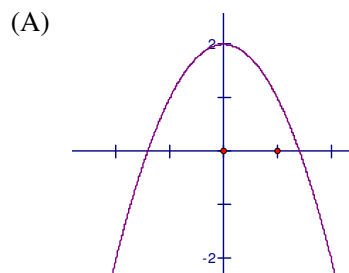
Section II
78 marks. Attempt Questions 23 – 28
Allow about 2 hours for this section
All necessary working should be shown in every question.

Answer each question on a separate A4 sheet of paper.

_____

Question 23 (13 marks)   **[START A NEW PAGE]**

(a) The ages of 12 members of a cricket team are recorded in age order:

      18, 19, 19, 20, 20, 21, 22, 23, 24, 24, 25, 35

    (i) Calculate the mean age of this team.

1

    (ii) Calculate the interquartile range.

2

(b) Virginia used the 'capture-recapture' technique to estimate the number of crabs in a lake.

She caught, tagged and released 160 crabs.
A week later she caught another 90 crabs at random, and of these, 22 are found to be tagged.

By calculation, estimate of the number of crabs in the lake, using the 'capture-recapture' technique.

2

(c) Jim bought an LCD television which was priced at $1 895. He paid a deposit of $500 and got a loan for the balance that was paid off by 24 monthly instalments of $76.50.

    (i) Calculate how much more the television will cost by buying on these terms rather than if bought for cash.
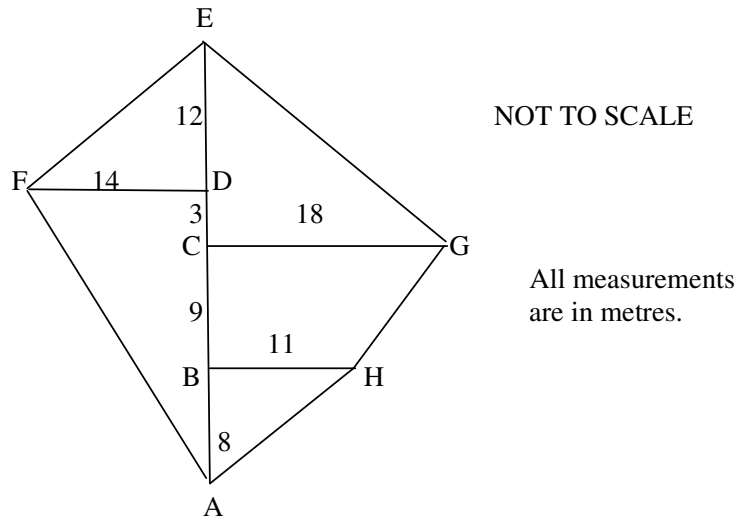
2

    (ii) What simple interest rate per annum, to one decimal place, was charged on this loan?

2

Question 23 continues on the next page.

Question 23 (continued)

(d)   A field diagram has been drawn from an offset survey.

E

12

F   14   D
              3   18
              C   G

              9   All measurements
                   11   are in metres.
              B   H

              8

A

NOT TO SCALE

(i)   What are the missing values of x and y in the offset survey from this field
        diagram?   **1**

E

	32	
14	x	
	17	18
	8	y
	0	

A

.
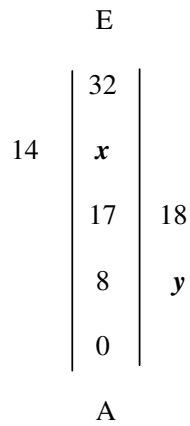
(ii)   Calculate the distance from G to H, to the nearest metre.   **2**

(iii)   Calculate the area of the field bounded by triangle AEF.   **1**

End of Question 23

Question 24 (13 marks)   **[START A NEW PAGE]**

(a)   Simplify $\dfrac{3k^2}{2m} \div \dfrac{mk}{4}$

3

(b)   Andrew is paid at these rates:

Weekday rate	$16.20 per hour
Saturday rate	Time-and-a-half
Sunday rate	Double time

His time sheet for this week is:

	START	FINISH
Thursday	6:00 pm	9:00 pm
Friday	5:00 pm	10:00 pm
Saturday	9:00 am	1:00 pm
Sunday	8:30 am	11:00 am

Calculate Andrew's gross pay for this week.

3

(c)   Belinda earned a gross income last year of $81 970. She had allowable tax
deductions of $4 260. Using the tax table, determine the tax payable on her
taxable income.

2

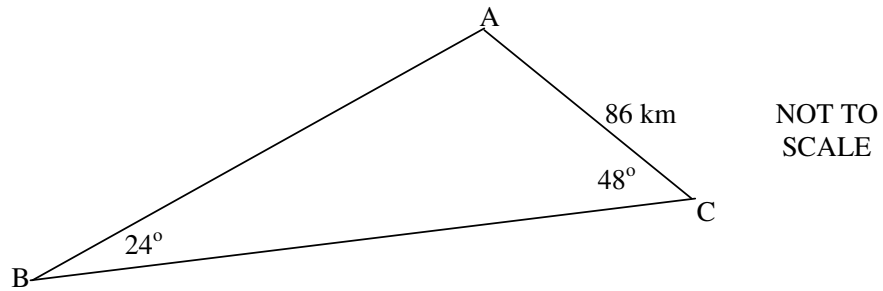| Taxable income	Tax on this income
0 – $6,000	Nil
$6,001 – $37,000	15c for each $1 over $6,000
$37,001 – $80,000	$4,650 plus 30c for each $1 over $37,000
$80,001 – $180,000	$17,550 plus 37c for each $1 over $80,000
$180,001 and over	$54,550 plus 45c for each $1 over $180,000

Question 24 continues on the next page.

(d)   Three towns A, B and C are marked on the diagram.

The distance from A to C is 86 km. $\angle ABC = 24^{o}$ and $\angle ACB = 48^{o}$.

(i)   Show, by calculation, that the distance from B to C is 201 km, to
the nearest kilometre.   **3**

(ii)   Find the area of land bounded by the towns ABC, to the nearest
square kilometre.   **2**

End of Question 24

Question 25 (13 marks)   **[START A NEW PAGE]**   **Marks**

(a)   Ros goes to a restaurant for dinner.

It offers the following choices for a three course meal.

1st course	2nd course	3rd course
ENTRÉE	MAINS	DESSERT
Club Salad	Scotch fillet	Pavlova
Salt & Pepper Squid	T-Bone Steak	Cheesecake
Carbonara Pasta	Chicken Schnitzel	Mud cake
	Grilled Salmon	

   (i)   How many combinations of three courses are possible?   **2**

   (ii)   If Ros definitely chooses cheesecake, how many combinations of three
        courses are possible for her?   **1**

(b)   The numerals 1 to 20 are written on identical cards which are then shuffled
    and placed face down.

    One card is selected at random from the cards, turned up and its numeral
    noted.

    What is the probability that it is:

   (i)   a multiple of 3?   **1**

   (ii)   not a 2-digit number?   **1**

Question 25 continues on the next page.

(c) A bank has three different types of savings accounts, as described in the table.

	Type 1	Type 2	Type 3
Account service fees per month:			
• if minimum monthly balance stays at or above $500	Nil	$5.00 Flat fee	Nil
• if balance drops below $500	$3.00		Nil
Number of fee-free transactions per month	12	Unlimited	6
Fee per transaction over the free limit	60 cents	Nil	60 cents

(i) Peter has a Type 1 account. In July, his minimum balance was $452, and he made fifteen transactions.

Calculate the fee he was charged for July. **2**

(ii) In any month, Ashley normally has between $200 and $400 in the bank. She usually makes about ten transactions per month.

Explain which account Type would suit her best, showing appropriate calculations. **2**

(d) A solid metal cone has a diameter of 20cm and a height of 25cm.

(i) Show that the volume of the cone is 2618cm^3, to 4 significant figures. **1**

(ii) If the cone is melted down and formed into a solid sphere calculate the radius of the sphere, to 3 significant figures. **3**
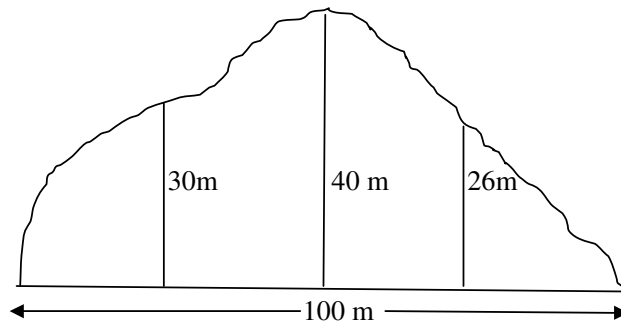
End of Question 25

Question 26 (13 marks)   **[START A NEW PAGE]**

(a)   Solve the equation $\dfrac{x-1}{3} - \dfrac{5-x}{2} = 4$

2

(b)   An aerial view of a lake is shown in the diagram below.

(i)   By using Simpson's Rule twice, calculate the approximate area of the surface of the lake.

3

(ii)   If the average depth of water in the lake is 3.5 metres, calculate the volume of water in the lake, to the nearest kilolitre.

2

(c)   A car has depreciated in value by 8% per annum. Three years after it was purchased it had depreciated to a value of $19 195, using the declining balance method.
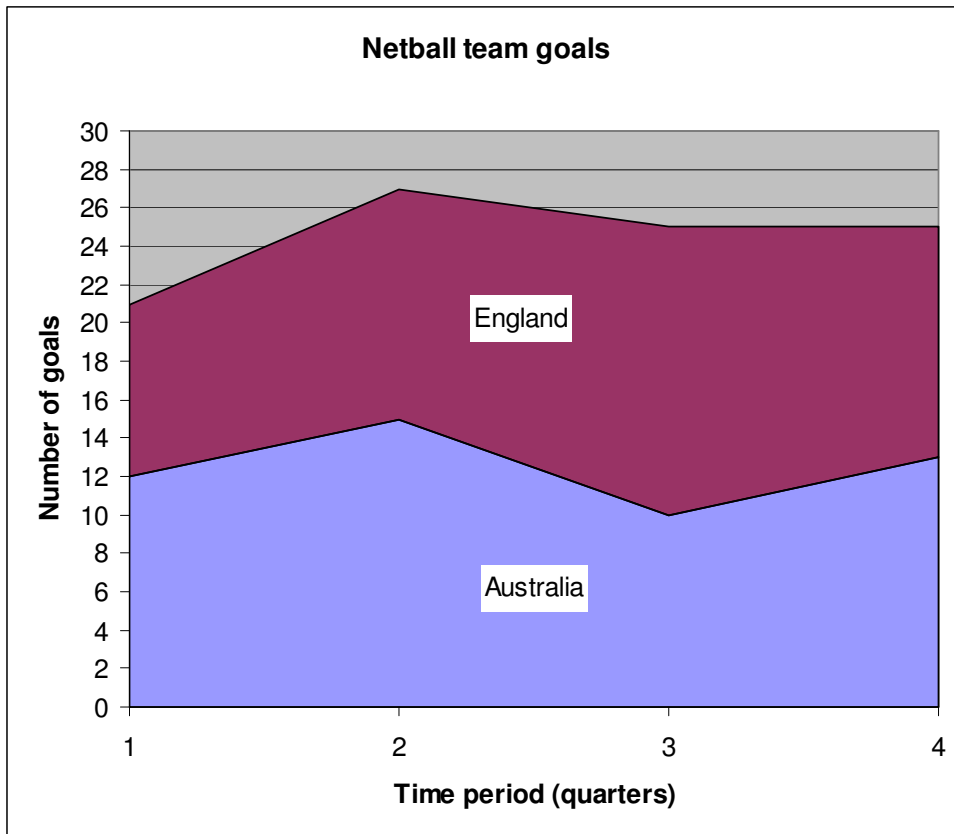
What was the purchase price of the car?

2

Question 26 continues on the next page.

(d)   The area chart below displays the goals scored by Australia and by England in
       each quarter in a netball match.

Netball team goals

(i)   Australia scored 12 goals in the first quarter time period. How many goals
      were scored by England in this first quarter?   **1**

(ii) In which quarter did England score the most goals?   **1**

(iii) What was the final score for each team?   **2**

End of Question 26

Question 27 (13 marks)   **[START A NEW PAGE]**   **Marks**

(a)   A spacecraft travels at 15 km/s.

How many days (correct to one decimal place) will it take this spacecraft to
travel from Earth to Mars, a distance of 7.83×10^7 km

2

(b)   The number of emus, E, after t years in a new colony can be found using the
formula:
$$E = a \times 2^t$$

(i)   If there are 32 emus after three years, find the value of a.

1

(ii) How many years will it take for the number of emus to first exceed 500?
Show relevant working.

2

(c)   Jacqui needs a minimum of $3000 to go on a holiday in two years time. She has a
savings account with a balance of $400.

(i)   She earns 6.6 % per annum interest on the money in this account, compounded
monthly. Calculate the final balance on this account after two years.

2

(ii) She has also arranged a second account where she deposits $100 into this
account at the end of each month for the next two years. Again she earns
6.6 % per annum interest on the money in this account, compounded monthly.
Calculate the final balance on this second account after two years.

2

(iii) Will Jacqui have enough money for her trip at the end of two years? Justify
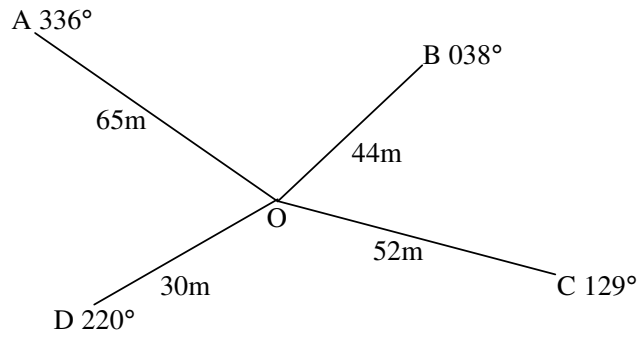your answer with suitable calculations.

1

Question 27 continues on the next page.

Question 27 (continued)

(d)   The following diagram shows the result of a compass radial survey.

A 336°

B 038°

65m

44m

O

52m

30m

C 129°

D 220°

(i)   Calculate the size of angle AOB.   **1**

(ii)   Calculate the distance between A and B, correct to the nearest metre.   **2**

End of Question 27

Question 28 (13 marks)   **[START A NEW PAGE]**   **Marks**
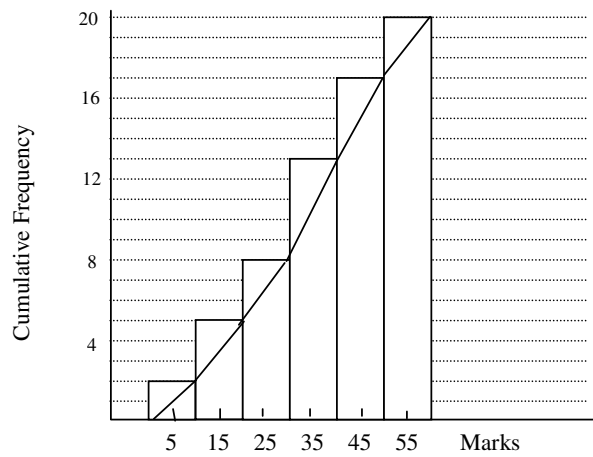
(a)   The rate of vibration of a string varies inversely as its length. A string 15 cm
       long vibrates at 5000 hertz.

       What length of string will vibrate at 4000 hertz?   **2**

(b)   A cumulative frequency histogram and ogive is shown for a test out of
       60 marks attempted by 20 students.

       (i) Estimate the median score for this test.   **1**

   (ii) How many students scored over 50 marks?   **1**

Question 28 continues on the next page.

(c) The following table describes data for the number of people using a swimming pool over 8 days in summer and the corresponding maximum temperature (in degrees Celsius) on each day.

Day	Temperature (°C) x	Number of people y
1	20	280
2	24	360
3	36	450
4	32	420
5	28	400
6	38	500
7	34	475
8	26	320

The scatterplot is obtained by plotting y against x, as shown below.
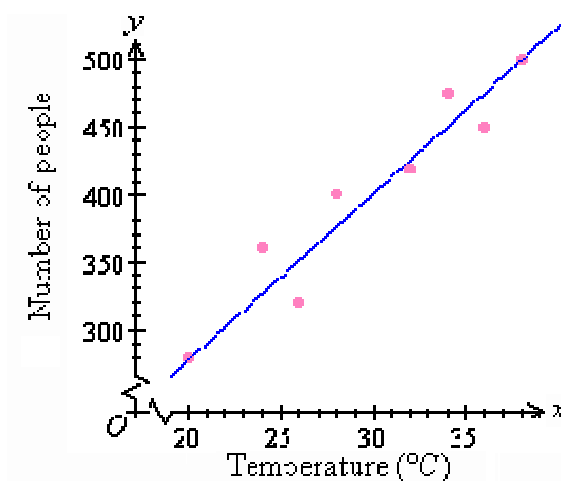
A line of best fit is drawn through the scatterplot.

(i) Find the gradient of this line of best fit. **2**

(ii) Write the equation of this line to state the relationship between the daily temperature, x, and the number of people, y. **2**

(iii) Using this relationship, predict the number of people that would swim at the pool if the temperature is $15°$ C. **1**

Question 28 continues on the next page.

Question 28 (continued)

(d)   A rectangular paddock on a farming property will be fenced around 3 sides with 180 metres of fencing.

180 - 2x

x | | x
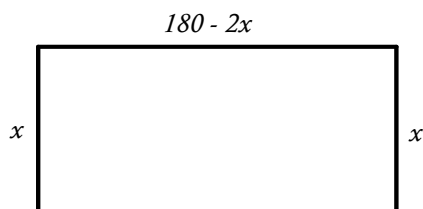
The area of the paddock can be calculated using the formula:

$A = x (180-2x)$

(i)   Copy and complete the table of values using the formula

$A = x (180-2x)$.

Length, x metres	0	15	30	45	60	75
Area, A m²	0	2250			3600	2250

1

(ii)   Use the table of values to plot the values on a number plane. Use about half a page to draw your number plane on your answer sheet, mark a scale on each axis and draw a smooth curve to join the points.

2

(iii)   What is the maximum possible area of the paddock?

1

End of Question 28

End of Paper

24

Formulae Sheet

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

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

θ = number of degrees in central angle

Arc length of a circle

$$\ell = \frac{\theta}{360}2\pi r$$

θ = number of degrees in central angle

Simpson's rule for area approximation

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

h = distance between successive measurements

d_f = first measurement

d_m = middle measurement

d_l = last measurement

Surface area

Sphere $\qquad A = 4\pi r^2$

Closed Cylinder $\qquad A = 2\pi rh + 2\pi r^2$

r = radius

h = perpendicular height

Volume

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

Cylinder $\qquad V = \pi r^2 h$

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

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

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

$$I = Prn$$

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

n = number of compounding periods

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 Distribution

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

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

$\bar{x}$ = 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

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

Gradient–intercept form of 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:

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

2011 Barker trial HSC exam - General Mathematics Solutions

1. B **2.** C **3.** D **4.** B **5.** D **6.** B **7.** A **8.** A **9.** B **10.** D **11.** C

12. D **13.** C **14.** B **15.** B **16.** C **17.** B **18.** C **19.** D **20.** B **21.** B **22.** A

23. (a)   (i) $\bar{x} = \frac{18+19+19+20+20+21+22+23+24+24+25+35}{12} = 22.5$

   (ii) $\mathrm{IR} = \frac{24+24}{2} - \frac{19+20}{2} = 4.5$

   (b) $160 \cdot \frac{90}{22} = 655$

   (c)   (i) $24 \cdot \$76.50 - (\$1895 - \$500) = \$441$

   (ii) $\frac{441 \div (24/12)}{1895 - 500} \times 100\% \text{p.a.} \approx 11.6\% \text{p.a.}$

   (d)   (i) $x = 17 + 3 = 20$, $y = 11$

   (ii) $\sqrt{9^2 + (18-11)^2}\text{m} \approx 11\text{m}$

   (iii) $\frac{1}{2} \times 14 \times (8 + 9 + 3 + 12)\text{m}^2 = 224\text{m}^2$

24. (a) $\frac{3k^2}{2m} \div \frac{mk}{4} = \frac{6k}{m^2}$

   (b) $(3 + 5 + 1.5 \times 4 + 2 \times 2.5) \times \$16.20 = \$307.80$

   (c) $\$4650 + 0.3 \times (\$81970 - \$4260 - \$3700) = \$26853$

   (d)   (i) $\frac{\sin(180° - 24° - 48°) \times 86}{\sin 24°}\text{km} \approx 201\text{km}.$

   (ii) $\frac{1}{2} \times 86 \times \frac{\sin(180° - 24° - 48°) \times 86}{\sin 24°} \sin 48° \approx 6426\text{km}^2.$

   Note. Use the exact value of BC, not 201. If you use 201 the answer is 6423km^2 which is wrong.

25. (a)   (i) $3 \times 4 \times 3 = 36$

   (ii) $3 \times 4 = 12$

   (b)   (i) $\frac{\lfloor 20/3 \rfloor}{20} = \frac{3}{10}$

   (ii) $\frac{9}{20}$

   (c)   (i) $\$3.00 + (15 - 12) \times \$0.60 = \$4.80$

(ii) Fee for Type 1 is \$3.00
Fee for Type 2 is \$5.00
Fee for Type 3 is $(10 - 6) \times \$0.60 = \$2.40$
$\therefore$ Type 3 is best.

(d) (i) $\frac{1}{3} \times \pi \times (20/2)^2 \times 25 \text{cm}^3 \approx 2618 \text{cm}^3$

26. (a) $\frac{x-1}{2} - \frac{5-x}{2} = \frac{2x-2-15+3x}{6} = \frac{5x-17}{6} = 4 \therefore x = \frac{4\times6+17}{5} = \frac{41}{5}$

(b) (i) $\frac{100\div4}{3}(0 + 0 + 2 \times 40 + 4 \times (30 + 26))\text{m}^2 = 2533\frac{1}{3}\text{m}^2$
Alternatively, $\left(\frac{100\div4}{3}(0 + 40 + 4 \times 30) + \frac{100\div4}{3}(40 + 0 + 4 \times 26)\right)\text{m}^2 = 2533\frac{1}{3}\text{m}^2$

(ii) $2533\frac{1}{3} \times 3.5\text{m}^3 \approx 8867\text{kL}$

(c) $\frac{\$19195}{(1-0.08)^3} \approx \$24650.44$

(d) (i) $21 - 12 = 9$

(ii) Number of goals scored in 1st quarter $= 21 - 12 = 9$
Number of goals scored in 2nd quarter $= 27 - 15 = 12$
Number of goals scored in 3rd quarter $= 25 - 10 = 15$
Number of goals scored in 4th quarter $= 25 - 13 = 12$
$\therefore$ quarter in which England scored the most goals was the 3rd.

(iii) Australia: $12 + 15 + 10 + 13 = 50$
England: $9 + 12 + 15 + 12 = 48$

27. (a) $\frac{7.83 \times 10^7}{15 \times 60 \times 60 \times 24} \approx 60.4$ days.

(b) (i) $32 \div 2^3 = 4$

(ii) $\left\lceil \frac{\log_{10}(500/4)}{\log_{10} 2} \right\rceil = 7$

(c) (i) $\$400 \times (1 + \frac{0.066}{12})^{2\times12} \approx \$456.28$

(ii) $\$100 \times \frac{(1+\frac{0.066}{12})^{2\times12}-1}{0.066/12} = \$2558.10$

(iii) Yes. $\$100 \times \frac{(1+\frac{0.066}{12})^{2\times12}-1}{0.066/12} + \$400 \times (1 + \frac{0.066}{12})^{2\times12} \approx \$3014.38 > \$3000.$

(d) (i) $360° - 336° + 38° = 62°$

(ii) $\sqrt{65^2 + 44^2 - 2 \times 65 \times 44 \times \cos 62°}\text{m} \approx 59\text{m}$

28. (a) $5000 \times 15 \div 4000 \text{cm} = 18.75 \text{cm}$

(b) (i) 34

    (ii) 3

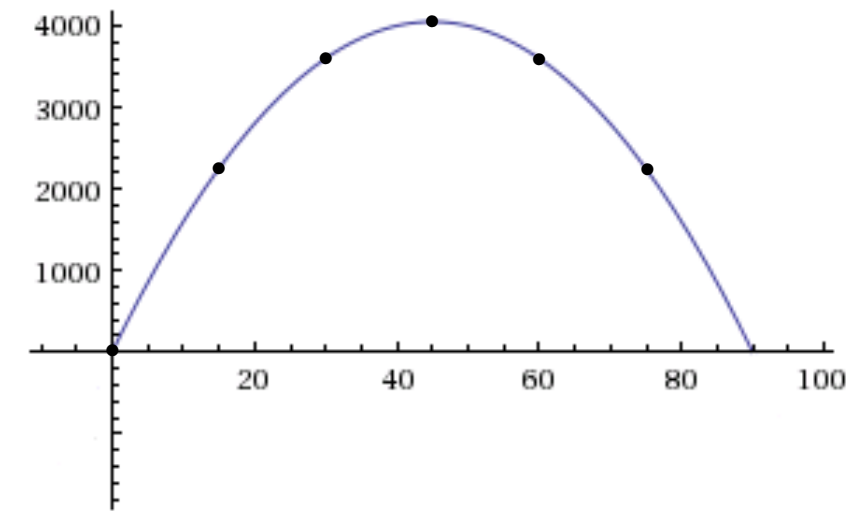**(c) (i)** $\frac{500-260}{38-20} = \frac{40}{3}$

    (ii) $y = 260 + \frac{40}{3}(x-20) = \frac{40}{3}x - \frac{20}{3}$

    (iii) $\frac{40}{3} \times 15 - \frac{20}{3} \approx 193$

(d) (i)

Length, x m	0	15	30	45	60	75
Area, A m^2	0	2250	3600	4050	3600	2250

(ii)

    (iii) 4050m^2