



Barker College

Student Number

2012
TRIAL
HIGHER SCHOOL
CERTIFICATE

General Mathematics

AM TUESDAY 31 JULY

Staff Involved:

- TE • JML
- AJD • ASW
- JMS • PJR
- JWH • KJL
- VAB* • GIC*

170 copies

General Instructions

- Working time – 2 hours 30 minutes plus 5 minutes reading time
- Write using black or blue pen. Black pen is preferred.
- Make sure your Barker Student Number is on ALL pages and booklets handed in.
- Approved calculators, graphic calculators and templates may be used.
- There is a formula sheet at the back of this paper which you should detach and refer to.

Total marks – 100

Section I

Pages 2 – 9

25 marks

- Attempt Questions 1 – 25.
- Allow about 40 minutes for this section.
- Answer this section on the Answer Sheet provided.

Section II

Pages 10 – 23

75 marks

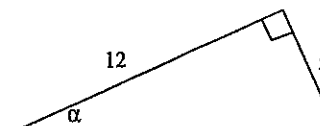
- Attempt Questions 26 – 30.
- Allow approximately 1 hour 50 minutes for this section.
- Answer this section in the answer booklets provided.
- Show ALL necessary working. Marks may be deducted for careless or poorly arranged work.

Section I

Allow about 40 minutes for this section.

Answer on the Answer Sheet provided.

1. Simplify $17x - 7 + 5x + 4$
(A) $22x + 3$ (B) $22x - 3$ (C) $12x + 3$ (D) $12x - 3$
2. Jemima's steps are on average 90 cm long. On a day when she walked 7.2 km, how many steps had she taken?
(A) 80 (B) 8000 (C) 648 (D) 6480
3. $16y^3 \times \frac{y^2}{2}$ simplifies to:
(A) $8y^5$ (B) $8y^6$
(C) $16y^4$ (D) $8y$
4. Rose invested \$3400 for 1.4% per annum simple interest for 1 year and 9 months. The amount of simple interest she earned was closest to:
(A) \$83 (B) \$90 (C) \$833 (D) \$900
5. For the triangle below which value is the largest?



NOT TO
SCALE

- (A) $\sin \alpha$ (B) $\cos \alpha$ (C) $\tan \alpha$ (D) $\sin \alpha \times \cos \alpha$

6. Which expression below is equivalent to $3y$?

- (A) $\sqrt{9y}$ (B) $\frac{18y}{6y}$
 (C) $\frac{27y^3}{9y^2}$ (D) $y \times y \times y$

7. The length of a path is measured as 10.0 metres, correct to 1 decimal place. The absolute error of the measurement is:

- (A) 5 m (B) 1 m (C) 0.5 m (D) 0.05 m

8. Evaluate, correct to 2 significant figures, $\frac{5.1 \times 10^{18}}{6.2 \times 10^3 \times 3.9 \times 10^{-3}}$

- (A) 3.2×10^{10} (B) 3.2×10^{23} (C) 2.1×10^{14} (D) 2.1×10^{15}

9. The Reds softball team had a mean score of 14 and a standard deviation of 6, while the Blues had a mean score of 18 and a standard deviation of 4.

Choose which of the following sentences is true.

- (A) Overall the Reds scores are higher and more spread out than the Blues.
 (B) Overall the Reds scores are higher but less spread out than the Blues.
 (C) Overall the Reds scores are lower but more spread out than the Blues.
 (D) Overall the Reds scores are lower and less spread out than the Blues.

10. Each Rentex share has a market value of \$9.36. Georgia buys 5000 shares and at the end of the financial year she receives a dividend of \$2106. The dividend yield on her investment is:

- (A) 4.06% (B) 4.5% (C) 5.5% (D) 22%

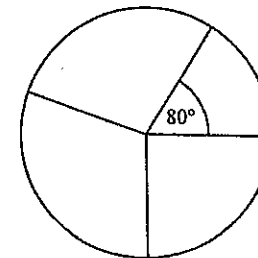
11. A circle has area 15 cm^2 . Its radius is closest to:

- (A) 2.2 cm (B) 2.4 cm (C) 3.4 cm (D) 8.7 cm

12. Ann borrowed \$112 000 for 20 years and repaid it in equal monthly instalments of \$1092. Which expression gives the total amount of interest she paid, in dollars?

- (A) $1092 \times 12 \times 20$ (B) $1092 \times 12 \times 20 - 112\ 000$
 (C) $112\ 000 - 1092 \times 20$ (D) $112\ 000 - 1092 \times 12$

- 13.



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This partly completed sector graph shows the sports choices made by all students in a primary school. The shaded sector represents the 72 basketball players.

The total number of students in the school is closest to:

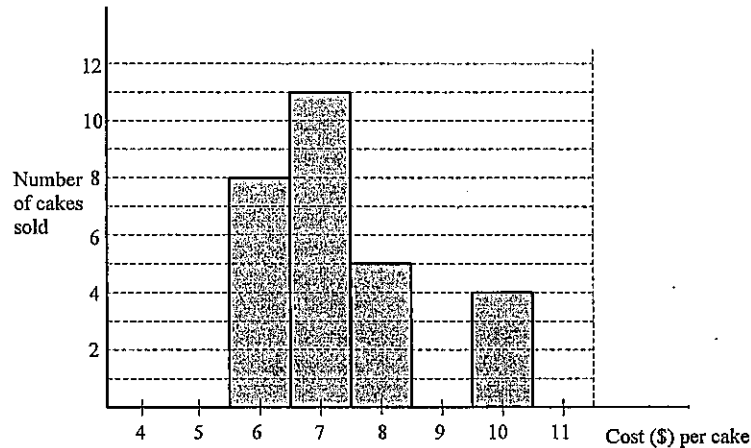
- (A) 259 (B) 288 (C) 324 (D) 400

14. Elias invested \$10 000 for 5 years at 7 % per annum interest, compounded every 3 months. Which is the correct expression for the new value of the investment?

(A) $10000 \times \left(1 + \frac{0.07}{3}\right)^{15}$ (B) $10000 \times \left(1 + \frac{0.07}{4}\right)^{15}$

(C) $10000 \times \left(1 + \frac{0.07}{3}\right)^{20}$ (D) $10000 \times \left(1 + \frac{0.07}{4}\right)^{20}$

You will need to refer to this diagram for Questions 15 and 16.



A class sold cakes at the Spring Fair and the histogram shows how many cakes of each price were sold.

15. What was the total number of cakes sold?

(A) 28 (B) 31 (C) 59 (D) 205

16. What was the median price paid?

(A) \$7.00 (B) \$7.30 (C) \$7.50 (D) \$8.00

17. George purchased new office furniture for \$8352. Using the straight line method of depreciation it would be worth nothing by the end of 8 years. When it was 3 years old the value of the furniture would be:

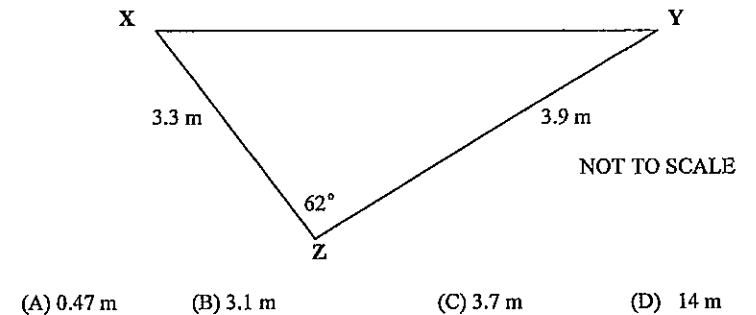
(A) \$1044 (B) \$3132 (C) \$5220 (D) \$7308

18. P can be found using the formula $P = 2 \times (y)^n$

When $y = 1.3$ and $n = 5$ the value of P is closest to:

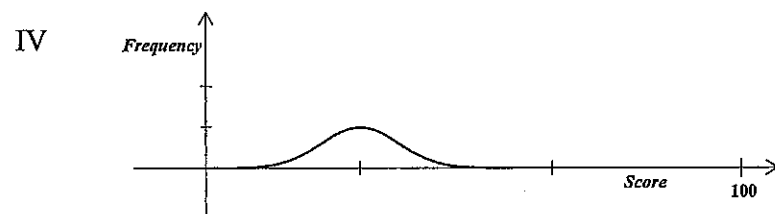
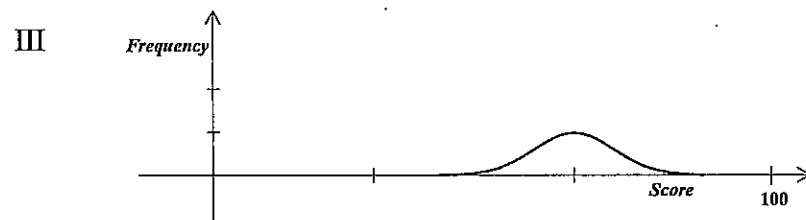
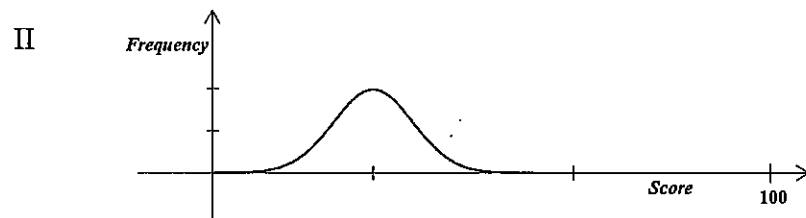
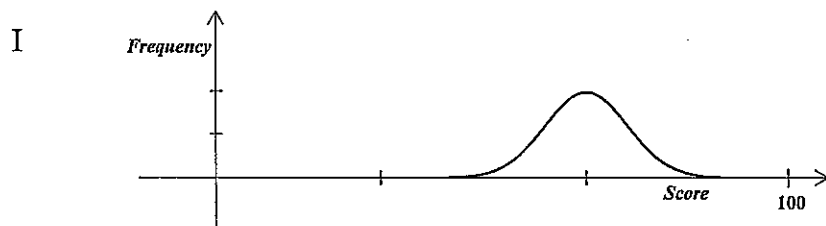
(A) 7.4 (B) 13 (C) 91 (D) 120

19. Use the cosine rule to find the length XY correct to 2 significant figures.

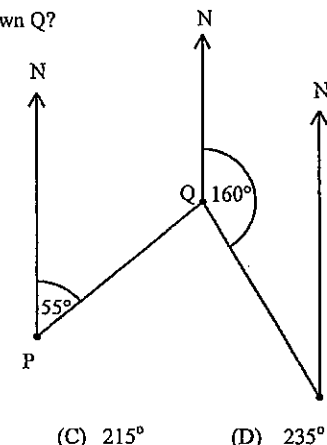


20. Below are four frequency distribution graphs. The first two are identical to each other in size and shape. The last two are also identical to each other in size and shape. Which are the graphs or graph with the highest mean?

(A) I only (B) I and II (C) I and III (D) II and IV



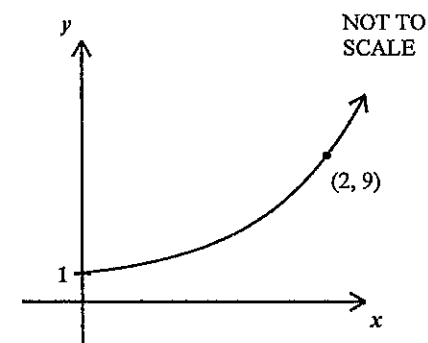
21. What is the bearing of town P from town Q?



(A) 055° (B) 105° (C) 215° (D) 235°

22. Which of the following could not be the equation of the curve below?

- (A) $y = 2x^2 + 1$
 (B) $y = x^3 + 1$
 (C) $y = 2^x$
 (D) $y = 3^x$

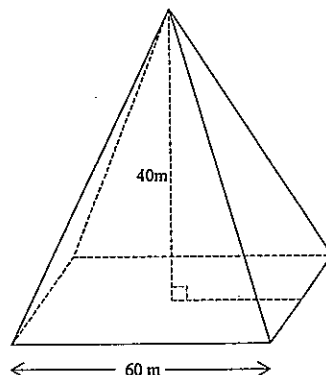


23. Place P has coordinates $(22^\circ\text{S}, 15^\circ\text{W})$.
 Place Q has coordinates $(52^\circ\text{S}, 45^\circ\text{E})$.
 When it is 7 pm at place P, what is the time at place Q?

(A) 11 pm (B) 9 pm (C) 5 pm (D) 3 pm

24. This square pyramid has perpendicular height 40 metres and base side length 60 metres. Choose the correct expression for its surface area, in square metres.

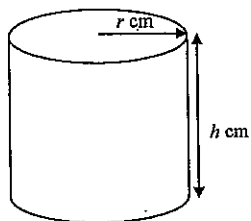
NOT TO SCALE



- (A) $SA = \frac{1}{3} \times 60^2 \times 40$ (B) $SA = \frac{1}{3} \times 60^2 \times 50$
 (C) $SA = 60^2 + 4 \times \frac{1}{2} \times 60 \times 40$ (D) $SA = 60^2 + 2 \times 60 \times 50$

25.

A cylinder has radius r cm and height h cm. A rectangular label is made to cover the curved surface of the cylinder. The rectangle is to have an extra 3 cm strip at one end, which will overlap at the other end. Which is the correct expression for the area of the rectangular label?



- (A) $(2\pi r h + 3) \text{ cm}^2$ (B) $(2\pi r + 3) h \text{ cm}^2$
 (C) $2\pi (r + 3) h \text{ cm}^2$ (D) $2\pi r (h + 3) \text{ cm}^2$

End of Section I

Section II

Allow about 1 hour and 50 minutes for this section.

Begin each question in a new answer booklet.

Show all necessary working.

Question 26 (15 marks)

[START A NEW BOOKLET]

Marks

(a) Solve: $9 = \sqrt{16 + 2x}$

2

(b) Make x the subject in the following formula: $4y = \frac{6 - 3x}{2}$

3

- (c) The base of an ornamental pond is an ellipse, shown below, with major axis 2.8 metres and minor axis 1 metre.

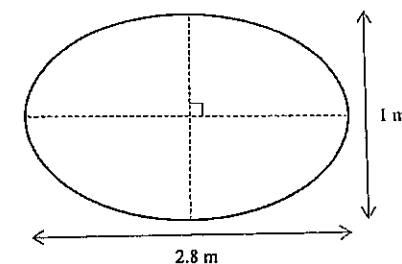
The pond is filled to its maximum depth of 30 cm.

3

- (i) Calculate the volume of water in the pond in m^3 .

1

- (ii) Find its capacity to the nearest litre.



Question 26 continues on the next page.

Question 26 (continued)

Marks

- (d) The quantity V is directly proportional to the square of x .

Given that $V = 7.2$ when $x = 1.2$:

- (i) find the equation that links V with x

2

- (ii) and hence find the value of x when $V = 28.8$

1

- (e) A plane starts at the location with coordinates (10°N , 10°E). It flies at an average speed of 288 knots due south for 75 minutes and then lands.

- (i) Calculate the distance in nautical miles the plane travels.

1

- (ii) Find the latitude and longitude of its landing place.

2

End of Question 26

Question 27 (15 marks) [START A NEW BOOKLET]

Marks

- (a) At a music camp each student is a member of the choir or the orchestra but not both. Their numbers are shown in this table.

	Girls	Boys	Totals
Choir	18	12	a
Orchestra	14	30	44
Totals	32	42	b

- (i) Write the values for a and b .

1

- (ii) What fraction of the girls are members of the orchestra?

1

- (iii) What percentage of the choir is made up of boys?

1

- (iv) Some extra boys arrived at camp and joined the choir so that now one third of all the boys are in the choir. How many new boys joined?

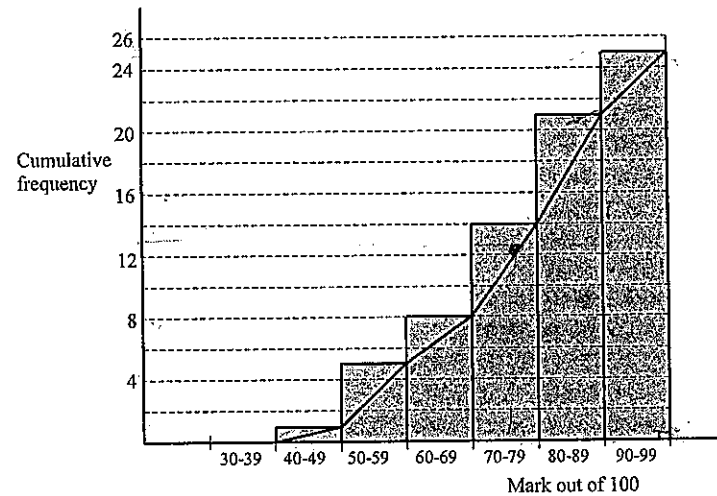
1

Question 27 continues on the next page.

Question 27 (continued)

Marks

- (b) The graph shows a grouped cumulative frequency histogram representing exam marks out of 100 for a class of 25 students.



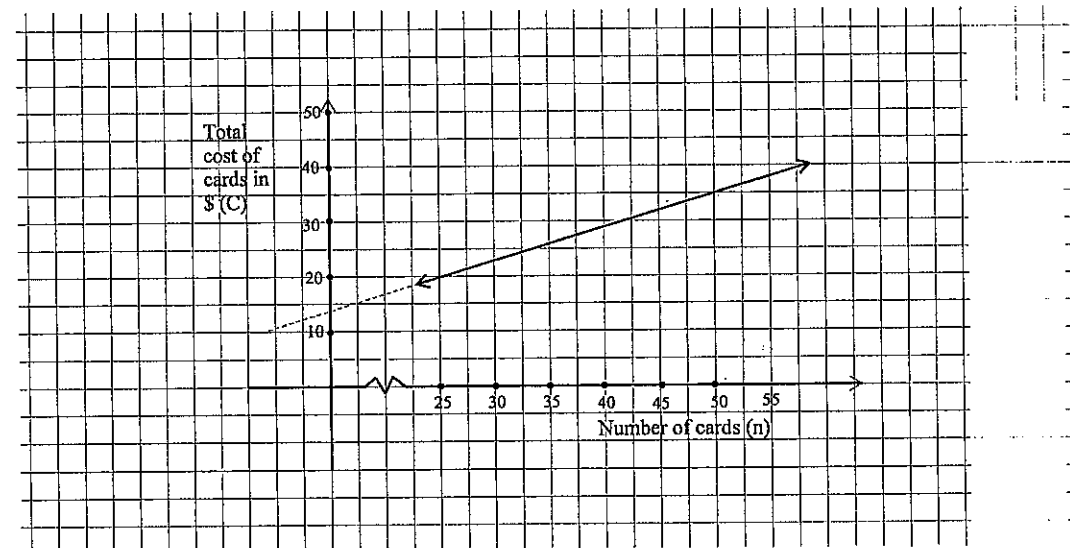
- What percentage of people scored less than 70%? 1
- How many people scored in the 80s? 1
- Determine the median mark as accurately as possible. 1
- Damien scored the 4th lowest mark. State a possible mark for him. 1
- Explain in one sentence a major disadvantage of presenting data in groups or classes, such as has been done in this graph. 1
- Based on this graph, what is the smallest possible range of marks for the students? You must show your calculation. 1

Question 27 continues on the next page.

Question 27 (continued)

Marks

- (c) The solid line in the graph below shows the total cost \$C (including delivery) of purchasing n greetings cards. The zigzag line means there is a gap in the horizontal axis.



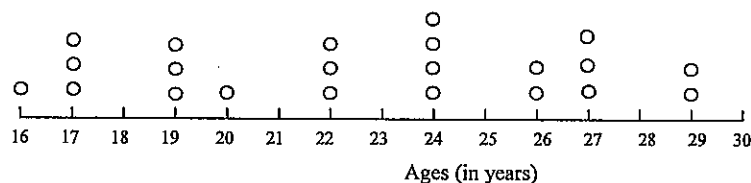
- Use the graph to determine how many cards you may purchase for a total cost of \$35. 1
- Calculate the gradient of the line. 1
- Polly decided the vertical intercept's value was about 14 after she drew in the dotted line shown. Explain briefly why this is incorrect. 1
- Find the equation of the line, expressing C in terms of n . 2

End of Question 27

Question 28 (15 marks) [START A NEW BOOKLET]

Marks

- (a) The dot plot shows the ages of 22 people in an athletics club.



- (i) Determine the median age. 1
- (ii) Calculate the inter-quartile range for this data. You must show a calculation. 1
- (iii) Calculate the population standard deviation for this data. 1
- Answer part (iv) on page 23 at the end of this paper. Detach page 23 and hand in with the answer booklet for this question.**
- (iv) Construct a box and whisker plot for these ages. 2
The extreme ends of the box and whisker plot have been drawn in to help you start the graph.
- (v) A new athlete joins the club but the box and whiskers plot stays exactly the same. What is a possible age for the new athlete? 1

Question 28 continues on the next page.

Question 28 (continued)

Marks

- (b) To make a certain raspberry drink the instructions are to add 150 mL concentrated cordial to every one litre of water.
- (i) How much concentrated cordial should you add to 3.5 litres of water? 1
- (ii) How much water would be needed to make up 69 litres of raspberry drink? 2
- (c) Given the function $y = x^2 - 2x$
- (i) Find the value of y when $x = 4$ 1
- (ii) Find the value of y when $x = -2$ 1
- Answer parts (iii) and (iv) on page 23 which you used in part (a).**
- (iii) On the graph provided, there are several points already plotted belonging to the curve $y = x^2 - 2x$. Plot the two new points obtained in (i) and (ii). 1
- (iv) Hence sketch the curve $y = x^2 - 2x$ 1
(You may plot additional points if you wish.)
- (v) Use the curve to determine approximate x value(s) when $y = 10$. 2

End of Question 28

Question 29 (15 marks) [START A NEW BOOKLET]

Marks

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

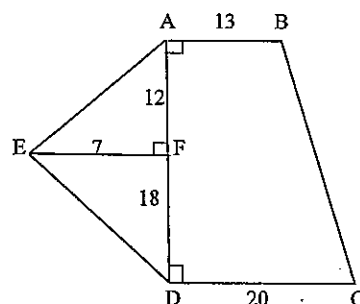
All measurements are in metres.

- (i) Calculate the length BC to 1 decimal place.

2

- (ii) Calculate the area of the figure ABCDE.

3



NOT TO SCALE

- (b) Joshua's photographic equipment was valued at \$9240 when new. For taxation calculations he used the declining balance method of depreciation using a rate of 16% depreciation per annum.

- (i) Determine the value of the equipment at the end of four years.

2

- (ii) Hence find the size of depreciation he can claim during the fifth year.

2

Question 29 continues on the next page.

Question 29 (continued)

Marks

- (c) Daniel saved \$516 each month and deposited it into an account. He earned 6% per annum interest, that is 0.5% per month, which was paid into his account monthly. Part of a table showing the ongoing value of Daniel's investment is shown below.

Month	Balance at start of month (\$)	Interest (\$)	Regular Deposit (\$)	Balance at end of month after deposit (\$)
10	4737.96	23.68	516	5277.66
11	5277.66			

- (i) Calculate the interest Daniel earns in the 11th month.

1

- (ii) Calculate the balance at the end of the 11th month.

1

- (iii) Use the future value annuity formula to show that after five years Daniel will have approximately \$36 000 in the account.

2

- (iv) Leana decided to invest in a similar account with the same conditions but she saved more quickly and accumulated \$36 000 by the end of just 3 years. Calculate the amount she must have deposited each month to achieve this.

2

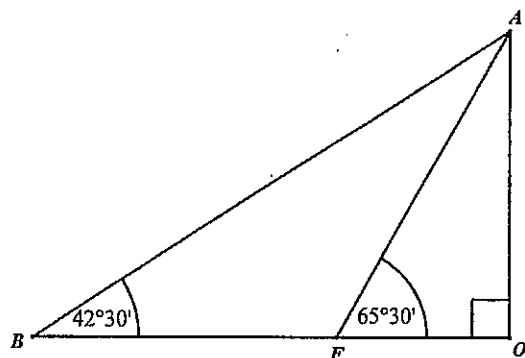
End of Question 29

Question 30 (15 marks) [START A NEW BOOKLET]

Marks

- (a) A stockbroking company charged commission of 1.4% for the first \$5000 of the value of shares purchased and 1% for every dollar over that value. Claire bought 1700 shares with a market value of \$4.20 each. Calculate how much commission she was charged.
- (b) In the diagram below OA represents an aerial. A boy and his father wish to determine its height. The boy measures the angle of elevation of the top of the aerial from point B and the father measures its angle of elevation from point F. Both angles are marked on the diagram. The boy and his father are 24 metres apart, standing on horizontal ground in a direct line with point O.

3



- (i) Show $\angle FAB = 23^\circ$
- (ii) Show the length of $AF = 41.5$ metres correct to 1 decimal place.
- (iii) Hence determine the height of the aerial OA.

1

2

2

Question 30 continues on the next page.

Question 30 (continued)

Marks

- (c) (i) David earned a taxable income of \$58 500. Use the tax table below to find his tax payable.

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

2

- (ii) Samantha used the same tax table and found that her tax payable was \$31 400. Calculate the taxable income she must have earned.

2

Question 30 (c) continues on the next page.

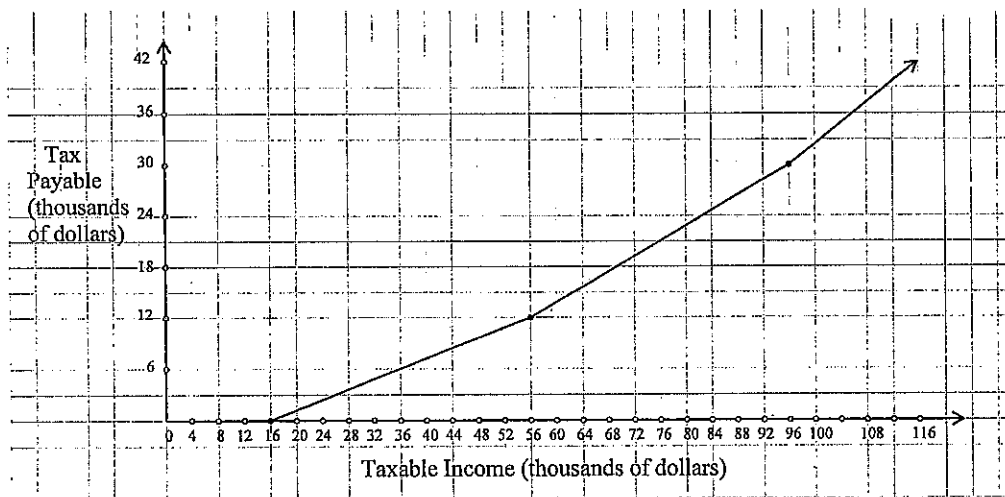
Question 30 (c) (continued)

Marks

Student Number

- (iii) An economist was in favour of introducing a new tax scheme, which is shown in the following graph and in the new tax table below. Refer to the graph to determine the values of X, Y and Z in the table.

3



Taxable income	Tax on this income
0 – \$16,000	Nil
\$16,001 – \$56,000	30 cents for each \$1 over \$16,000
\$56,001 – \$96,000	\$X plus Y cents for each \$1 over \$Z
\$96,001 and over	\$30,000 plus 60 cents for each \$1 over \$96,000

End of Question 30

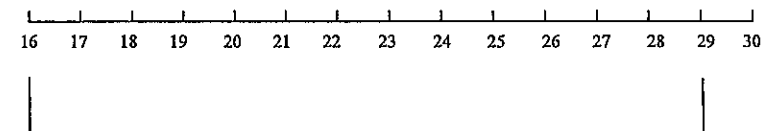
End of Question Paper

An answer page follows on page 23 which you need to use for Q28.

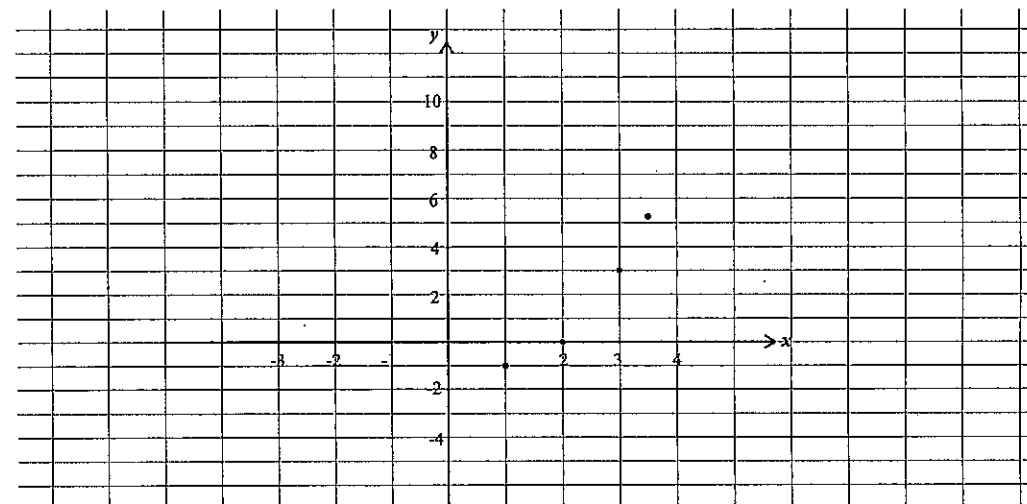
Detach this page and hand it in with your answer booklet for Q 28.

Question 28 (a) (iv)

Ages of members of an athletics club



Question 28 (c) (iii) and (iv)

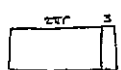


23. 15° longitude = 1 hour
 $15^\circ + 15^\circ = 60^\circ = 4$ hrs
 Q is further east $\therefore$ 4 hrs
 ahead of P
 $\therefore$ Q is 11 pm (A)

24. SA = Square base + 4 triangles

base = 60^2
 triangle = $\frac{1}{2} \times 60 \times 50$
 4 triangles = $4 \times \frac{1}{2} \times 60 \times 50$
 $= 2 \times 60 \times 50$

$$SA = 60^2 + 2 \times 60 \times 50 \quad (D)$$

25.  (B)
 $A = h(2\pi r + 3) \text{ cm}^2$

SECTION 2

Question 26

a) $\sqrt{16+2x} = 9$
 $16+2x = 81$
 $2x = 65$
 $x = 32.5$

b) $8y = 6-3x$
 $3x+8y = 6$
 $3x = 6-8y$
 $x = \frac{6-8y}{3}$

c) $30 \text{ cm} = 0.3 \text{ m}$
 $\therefore$ Vol = Area of ellipse $\times h$
 $= \pi ab \times h$
 $= \pi \times 1.4 \times 0.5 \times 0.3$
 $= 0.6597 \dots$
 $= 0.66 \text{ m}^3 \text{ (2dp)}$

d) $1 \text{ m}^3 = 1000 \text{ L}$
 $= 0.6597 \dots \times 1000$
 $= 660 \text{ L}$

e) $V \propto x^2$
 $V = Kx^2$ K constant

f) $V = 7.2, x = 1.2$
 $7.2 = K(1.2)^2$
 $K = \frac{7.2}{(1.2)^2} = 5$

g) $V = 5x^2$
 $28.8 = 5x^2$
 $x^2 = \frac{28.8}{5}$
 $x = \sqrt{\frac{28.8}{5}} = 2.4$

e) 1 knot = 1 n.mile/h
 distance = $\frac{258}{1} \times 1 \frac{1}{4}$
 $= 360 \text{ n.miles}$

ii) Plane flies due south
 $1^\circ = 60 \text{ n.miles}$
 $= 6^\circ \text{ South}$
 $(4^\circ \text{ N}, 10^\circ \text{ E})$ is landing place w.r.t.

Question 27

a) i) $a = 18+12 = 30$
 $b = 32+42 = 74$

ii) $\frac{14}{32} = \frac{7}{16}$

iii) $\frac{12}{30} \times 100\% = 40\%$

iv) 3 new boys
 would make 15 boys
 and 15 in the choir
 $\therefore \frac{15}{45} = \frac{1}{3}$ in choir

b) i) $\frac{8}{25} = 32\%$

ii) $21-14 = 7$ people
 Go across from 12.5
 on cum. freq. axis to graph
 and go down to read off mark
 out of 100 approx 77%
 (accept 76-78%)

iii) Any mark 51-59 (in the 2nd column)

iv) We don't know what
 particular mark each student
 got so we lose the accuracy
 of particular data

v) $90-49 = 41$ range

c) i) 50 cards
 ii) choose pts (25,20) (50,35)
 $m = \frac{35-20}{50-25} = \frac{15}{25} = \frac{3}{5}$

iii) The horizontal axis has
 a gap (there are values missing
 and $\therefore$ the scale cannot
 be determined for these)

iv) Use $C = mn+b$ (like
 graphing)
 $C = \frac{3}{5}n + b$
 choose pt (50,35)

BARKER COLLEGE 2012

YEAR 12 GENERAL MATHS TRIAL

SECTION 1 MULTIPLE CHOICE

1. $22x - 3$ (B)

2. $7.24 \text{ km} = 7200 \text{ m}$
 $= 720000 \text{ cm}$

3. $\frac{720000}{90} = 8000$ steps
 (B)

4. $\frac{16y^3 \times 4z^2}{1} = 8y^3$ (A)

5. $I = P \times R \times T$
 $= 3400 \times 1.4\% \times 1 \frac{3}{12}$
 $= 3400 \times \frac{1.4}{100} \times 1.75$
 $= \$83.80$
 $\approx \$83$ (A)

6. $\sin x = \frac{5}{13}$
 $\cos x = \frac{12}{13}$
 $\tan x = \frac{5}{12}$

7. $\sin x \times \cos x = \frac{5}{13} \times \frac{12}{13}$
 $\therefore$ largest is $\cos x$ (B)

8. $\frac{3x^2y}{xy^2} = 3y$

9. Absolute error = $\frac{1}{2} \times$ accuracy
 measured to
 1 dec pl $\therefore \frac{1}{2} \times 0.1 = 0.05$
 (D)

10. $2.109 \dots \times 10^{15}$
 $= 2.1 \times 10^{15} \text{ (2 sig fig)}$
 (D)

11. Reds have less average
 but higher standard deviation
 $\therefore$ (C)

12. $5000 \times \$9.36 = \46800
 $\therefore \frac{3106}{46800} \times 100\%$
 $= 4.5\%$ (B)

13. $15 = \pi r^2$
 $r^2 = \frac{15}{\pi}$
 $r = \sqrt{\frac{15}{\pi}} \approx 2.185 \dots$
 $\approx 2.2 \text{ cm}$ (A)

12. Amount repaid

$= \$1092 \times 20 \times 12$
 $= \$262080$

$\therefore$ Interest = $\$262080 - \12000
 $= \$250080$

(B)

13. $\frac{80}{360} = \frac{2}{9} = 72$ players
 $\therefore \frac{1}{9} = 36$ players

$\therefore 36 \times 9 = 324$ students (C)

14. $10000 \left(1 + \frac{0.07}{4}\right)^{20}$

(5 yrs = 5 x 4 lots of 3 mths
 $= 20$ ($\frac{1}{4}$ of a year))

7% pa = $\frac{7\%}{4}$ per $\frac{1}{4}$ of a year
 $\therefore \frac{0.07}{4}$ (D)

15. $8+11+5+4 = 28$
 (A)

16. 28 cakes in median
 will be between 14th & 15th
 value
 $\frac{7+7}{2} = 7$ (A)

17. $\frac{8352}{8} = \$1044$

depreciation
 each year

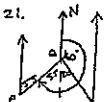
After 3 years:
 $8352 - 3 \times \$1044 = \5520
 (C)

18. $P = 2 \times (1.3)^5$
 $= 7.425 \dots$ (A)

19. $XY^2 = 3.3^2 + 3.7^2 - 2 \times 3.3 \times 3.7$
 $\times \cos 62^\circ$
 $= 14.015 \dots$
 $XY = \sqrt{14.015} = 3.74 \dots$

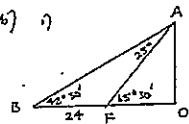
$XY \approx 3.7 \text{ m}$ (C)

20. highest sales I and III
 (C)

21. 
 $160^\circ + 20^\circ + 55^\circ$
 $= 235^\circ$ (D)

22. (C) pt (2,9) does NOT
 satisfy $y = 2^x$
 $9 \neq 2^2$

6) i)



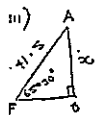
$$\angle BAF = 65^\circ 30' - 42^\circ 30' = 23^\circ \text{ (ext. } \angle \text{ of } \triangle)$$

OR do $\angle AFB = 114^\circ 30'$
 $\angle FAS = 180^\circ - 114^\circ 30' - 42^\circ 30' = 23^\circ$

ii) use sine rule

$$\frac{AF}{\sin 42^\circ 30'} = \frac{24}{\sin 23^\circ}$$

$$AF = \frac{24}{\sin 23^\circ} \times \sin 42^\circ 30' = 41.496 \dots = 41.5 \text{ m (1dp)}$$



$$\sin 65^\circ 30' = \frac{x}{41.5}$$

$$x = 41.5 \times \sin 65^\circ 30' = 37.763 \dots$$

$\therefore$ Aerial OA is 37.7 m high (2dp)

c) i) Tax payable =

$$\$4650 + 0.30 \times (\$5500 - \$37000) = \$4650 + 0.30 \times \$21500 = \$11100$$

ii) work backwards:

$$\$21500 - \$17550 = \$13850$$

So, to find the amount over \$30 000, say M

$$\$13850 = 0.37 \times M$$

$$M = \frac{13850}{0.37} = \$37432.43$$

$\therefore$ Taxable Income

$$= \$30000 + \$37432.43 = \$117432.43$$

$$\text{iii) } X = 0.3 \times (\$6000 - \$16000) = 0.3 \times 40000 = \$12000$$

(or read X off the graph at (56, 12))

Y is the gradient of the 2nd section of the graph use (56, 12) (96, 30)

$$m = \frac{30-12}{96-56} = \frac{18}{40} = \frac{9}{20}$$

$$\therefore \frac{9}{20} \times 56 = 25.2$$

$$\therefore Y = 25.2$$

$$Z = \$56000$$

(you can read it off the graph as the start of the 2nd section)

OR use the table and follow the pattern and take the smallest number in the taxable income row

END OF PAPER!

$$35 = \frac{3}{5} \times 50 + b$$

$$35 = 30 + b$$

$$\therefore b = 5$$

$$\therefore C = \frac{3}{5}n + 5$$

Question 28

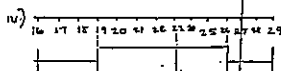
a) i) 22 people $\therefore$ median is between 11th & 12th steps
 ie $\frac{22+24}{2} = 23$

$$\text{ii) } Q_1 = 6^{\text{th}} \text{ score} = 19$$

$$Q_3 = 17^{\text{th}} \text{ score} = 26$$

$$\text{IQR range} = Q_3 - Q_1 = 26 - 19 = 7$$

$$\text{iii) } 4.02$$



v) If the box and whiskers plot does NOT change, then the possible age for the new athlete is the median age ie 23 yrs

$$\text{b) i) } 150 \times 3.3 = 525 \text{ mL}$$

ii) 1 L of water makes up 1.15 L of raspberry drink
 $\therefore$ 1 L of rasp. drink = $\frac{1}{1.15}$ L water

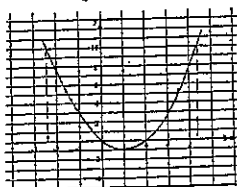
$$\therefore 69 \text{ L of rasp. drink} = \frac{69}{1.15} \text{ L} = 60 \text{ L water}$$

$$\text{c) i) } y = 4^x - 2x + 16 - 8 = 8$$

$$\text{ii) } y = (2^x)^2 - 2x - 2 = 4 + 4 = 8$$

$$\therefore y = 8$$

$$\text{iii) } y = 2x^2 - 2x$$



v) reading off graph x-values for $y=10$
 $x \approx 4.3$ or -2.4
 (allow for slight error)

Question 29

$$\text{a) i) } x^2 = 7^2 + 30^2 = 949$$

$$\text{ii) } x = \sqrt{949} = 30.8 \text{ m}$$

$$\text{ii) Area } \triangle AED + \text{Trapezium } ABCD = \frac{1}{2} \times 30 \times 7 + \frac{1}{2} (13+20) \times 30 = 105 + 495 = 600 \text{ m}^2 \text{ area of } ABCDE$$

$$\text{b) i) } V_5 = 9240 (1 - 16\%)^4 = 9240 \times 0.84^4 = \$4600.33$$

ii) After 5 years:

$$V_5 = 9240 (1 - 16\%)^5 = 9240 \times 0.84^5 = \$3864.28$$

$\therefore$ depreciation during 5th year

$$= \$4600.33 - \$3864.28 = \$736.05$$

Page 3

$$\text{c) i) } 0.5\% \times \$5277.46 = \$26.39$$

$$\text{ii) } \$3277.46 + \$26.39 + \$516 = \$3819.85 \text{ balance}$$

$$\text{iii) } A = 516 (1.005^{60} - 1) = 0.005$$

NB. 5 yrs = 60 mths.

$$\therefore A = \$36001.33 \div \$36000$$

$$\text{iv) } 36000 = M (1.005^{36} - 1) = 0.005$$

$$M = \frac{36000 \times 0.005}{(1.005^{36} - 1)} = \$915.19 \text{ per month}$$

Question 30

$$\text{a) i) } 1700 \times \$4.20 = \$7140$$

now $\$7140 = \$5000 + \$2140$

$$\text{Commission} = 1.4\% \times \$5000 + 1\% \times \$2140 = \$91.40$$

OR

$$= 0.16 \times 4600.33 = \$736.05$$