| Surname | | Other Names | |
|---|---|---|---|
| Centre Number | | Candidate Number | |
| Candidate Signature | | | |

General Certificate of Secondary Education
June 2003

**AQA**

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

## MATHEMATICS (MODULAR) (SPECIFICATION B)   33001/IA
## Module 1  Intermediate Tier  Section A

Thursday 12 June 2003  1.30 pm to 1.55 pm

**In addition to this paper you will require:**
- a calculator
- mathematical instruments
- a treasury tag.

Time allowed for Section A: 25 minutes

| Section A | | Section B | |
|---|---|---|---|
| Number | Mark | Number | Mark |
| 1 | | 5 | |
| 2 | | 6 | |
| 3 | | 7 | |
| 4 | | 8 | |
| | | 9 | |
| Total Section A | | | |
| Total Section B | | | |
| TOTAL | | | |
| Examiner's Initials | | | |

**Instructions**
- Use blue or black ink or ball-point pen.  Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Do all rough work in this booklet.
- This paper is divided into **two** sections: Section A and Section B.
- After the 25 minutes allowed for Section A, you must put your calculator on the floor under your seat.  You will then be given Section B.
- When you have answered Section B you may work again on Section A but you may **not** use your calculator.  It must remain on the floor under your seat.
- At the end of the examination, make sure that you hand in **both** Section A and Section B securely tagged together with Section A on top.

**Information**
- The maximum mark for Section A is 20.
- Mark allocations are shown in brackets.
- Additional answer paper and graph paper will be issued on request and must be tagged securely to this answer booklet.
- You are expected to use a calculator where appropriate.

**Advice**
- In all calculations, show clearly how you work out your answer.

Answer **all** questions in the spaces provided.

1 The time, in minutes, that seven teenagers spent using their computer and spent watching TV on one day is recorded in the table.

| Time spent using computer (minutes) | 10 | 20 | 30 | 40 | 45 | 55 | 60 |
|---|---|---|---|---|---|---|---|
| Time spent watching TV (minutes) | 50 | 40 | 45 | 40 | 30 | 30 | 20 |

(a) Plot these data as a scatter graph on the grid below.

*(2 marks)*
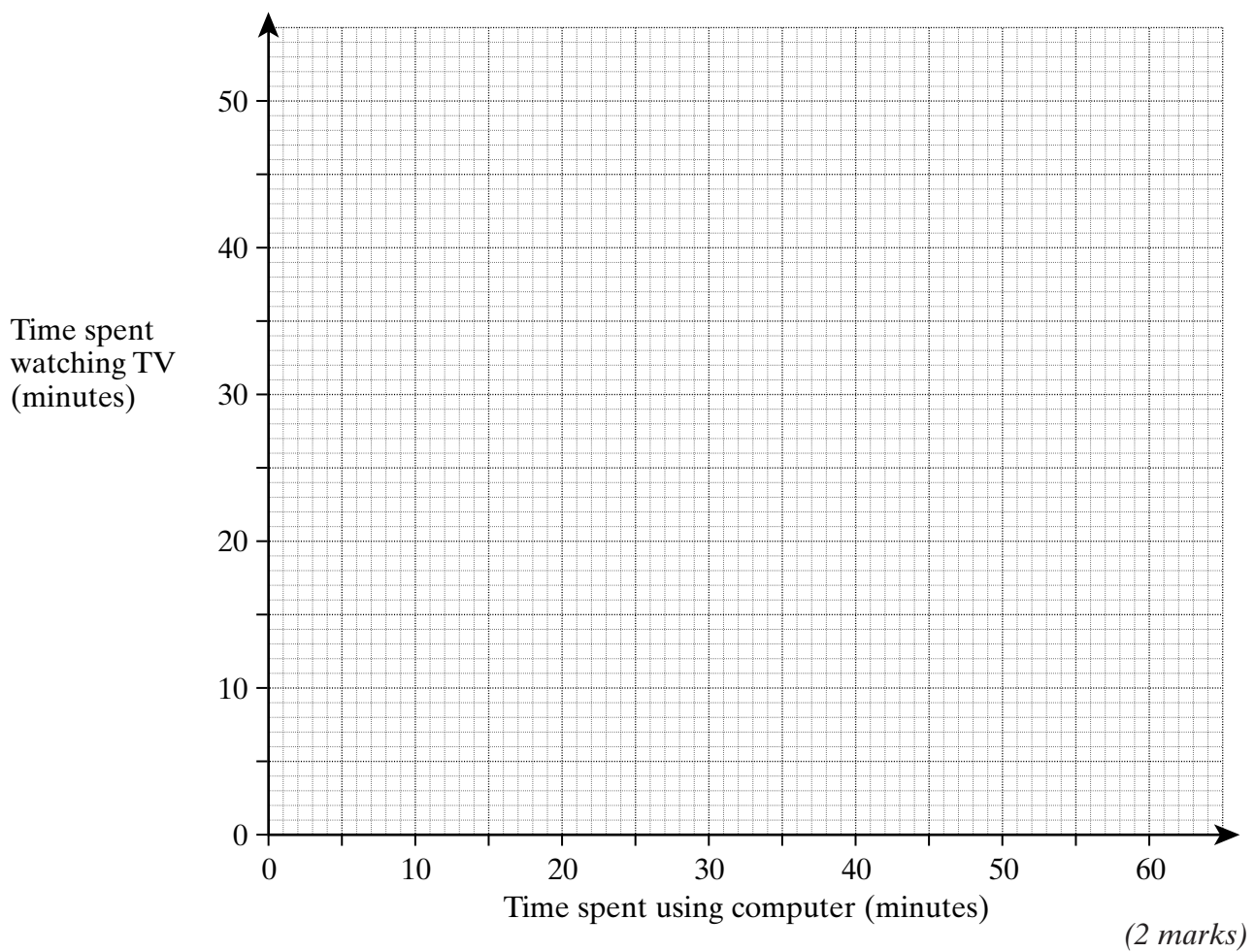
(b) Draw a line of best fit on your scatter graph. *(1 mark)*

(c) Describe the relationship shown in the scatter graph.

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*(1 mark)*

(d)   A questionnaire contained the following question.

> Don't you agree that spending time using a computer is better
> for a child's education than spending time watching TV?

Give **one** reason why this question is not suitable for the questionnaire.

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*(1 mark)*

**TURN OVER FOR THE NEXT QUESTION**

**Turn over** ▶

APW/6Q03/33001/IA

**2** Ashraf is playing a game with a fair coin and a fair triangular spinner with sections numbered 2, 3 and 4.
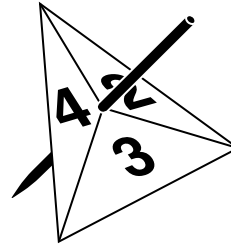


He flips the coin and then spins the spinner.

If the coin shows heads, his score is the number on the spinner **multiplied** by 3.
If the coin shows tails, his score is the number on the spinner.

(a)   Complete the table to show all the possible scores that Ashraf can get.

|  |  | **Spinner** | | |
|---|---|---|---|---|
|  |  | **2** | **3** | **4** |
| **Coin** | **Heads** |  |  |  |
|  | **Tails** |  |  |  |

*(2 marks)*

(b)   Write down the probability that Ashraf gets a score of

(i)   9,

Answer ........................................................  *(1 mark)*

(ii)   6 or less.

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Answer ........................................................  *(2 marks)*

**3**   The table shows the times taken by a group of ramblers to complete a five mile walk.

| Time, $t$ (minutes) | Number of ramblers |
|---|---|
| $100 \leqslant t < 110$ | 6 |
| $110 \leqslant t < 130$ | 7 |
| $130 \leqslant t < 150$ | 8 |
| $150 \leqslant t < 200$ | 4 |

(a)   Calculate an estimate of the mean time taken by these ramblers to complete the walk.

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Answer ........................................................... minutes    *(4 marks)*

(b)   Which class interval contains the median time of these ramblers?

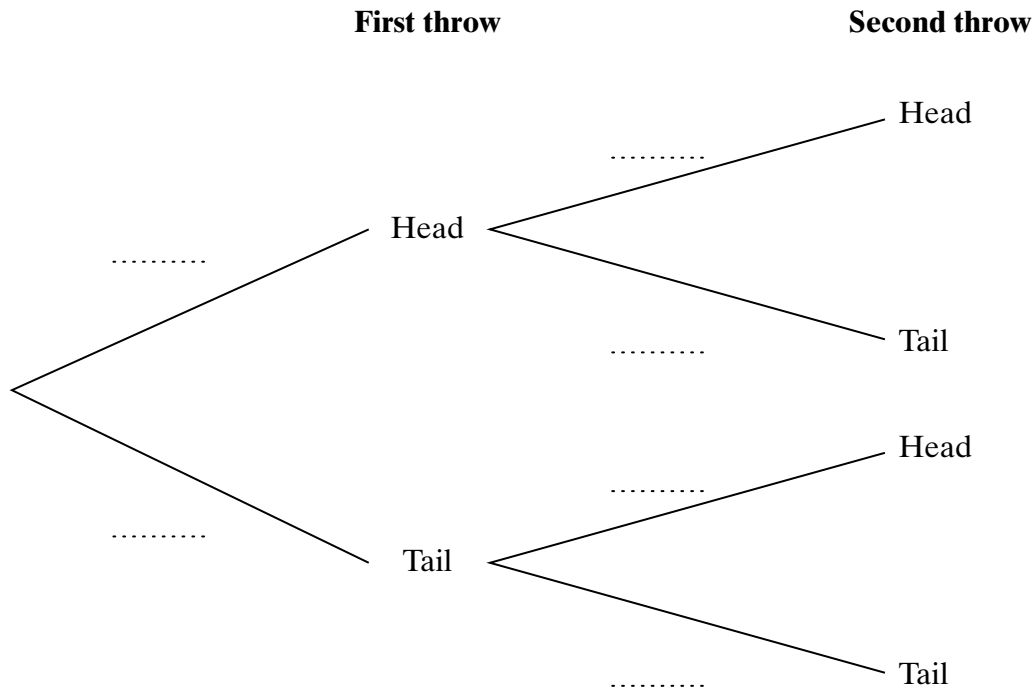.........................................................................................................................................

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Answer ........................... $\leqslant t <$ ...........................    *(2 marks)*

6

**Turn over** ▶

**4**  Danny has a biased coin.

The probability that the coin lands heads is $\frac{2}{3}$ .

Danny throws the coin twice.

(a)  Fill in the probabilities on the tree diagram.

**First throw**                                      **Second throw**

                                                              Head
                                        ...........
                     Head
          ...........
                                        ...........
                                                              Tail


                                        ...........          Head
          ...........
                     Tail
                                        ...........
                                                              Tail

*(2 marks)*

(b)  Calculate the probability that Danny gets two heads.

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Answer ........................................................................  *(2 marks)*

$\boxed{4}$

**END  OF  SECTION  A**

| Surname | | Other Names | |
| --- | --- | --- | --- |
| Centre Number | | Candidate Number | |
| Candidate Signature | | | |

General Certificate of Secondary Education
June 2003

**MATHEMATICS (MODULAR) (SPECIFICATION B)   33001/IB**
**Module 1  Intermediate Tier  Section B**

Thursday 12 June 2003  2.00 pm to 2.25 pm

**In addition to this paper you will require:**
   mathematical instruments.
You must **not** use a calculator.

Time allowed for Section B: 25 minutes

**Instructions**
- Use blue or black ink or ball-point pen.  Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Do all rough work in this booklet.
- You may **not** use your calculator in Section B.  Your calculator must remain on the floor under your seat.
- When you have answered Section B you may work again on Section A but you may **not** use your calculator.  It must remain on the floor under your seat.
- At the end of the examination, make sure that you hand in **both** Section A and Section B securely tagged together with Section A on top.

**Information**
- The maximum mark for Section B is 20.
- Mark allocations are shown in brackets.
- Additional answer paper and graph paper will be issued on request and must be tagged securely to this answer booklet.

**Advice**
- In all calculations, show clearly how you work out your answer.
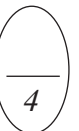
Answer **all** questions in the spaces provided.

**5** Emma reads in a magazine that there is a link between the number of children and the number of pets in a family.

(a)   Design a two-way table to record the number of pets and the number of children in a sample of families.

*(3 marks)*

(b)   Complete your two-way table by inventing data for eight families.      *(1 mark)*

*4*

**TURN  OVER  FOR  THE  NEXT  QUESTION**

**Turn over** ▶

**6** Red, blue, white and green tickets are sold in a raffle.

The table shows some of the probabilities of these tickets winning the first prize.

| Ticket colour | Probability of winning first prize |
|---|---|
| Red | 0.4 |
| Blue | 0.2 |
| White | 0.1 |
| Green | |

(a) Calculate the probability of a green ticket winning the first prize.

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Answer ...................................................................... *(2 marks)*

(b) There were 1000 tickets sold in this raffle.

Calculate how many red tickets and blue tickets were sold altogether.

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Answer ...................................................................... *(2 marks)*

4

**7** A sample of 19 students was taken from Newtown College.

The stem and leaf diagram shows the number of days that these students were absent last year.

Key: | 1 | 7 represents 17 days

| 0 | 3 | 4 | 4 | 6 | 8 | 9 |   |
| 1 | 0 | 0 | 2 | 3 | 5 | 5 | 7 | 8 |
| 2 | 0 | 1 | 3 | 4 | 6 |

(a) Write down the median number of days absent.

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Answer .................................................................... *(1 mark)*

(b) Calculate the range of the number of days absent.

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Answer .................................................................... *(1 mark)*

(c) Jane is a student at the college.

When her number of days absent last year is added to the stem and leaf diagram both the median and the range increase by one.

How many days was Jane absent from college last year?

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Answer .................................................................... *(2 marks)*
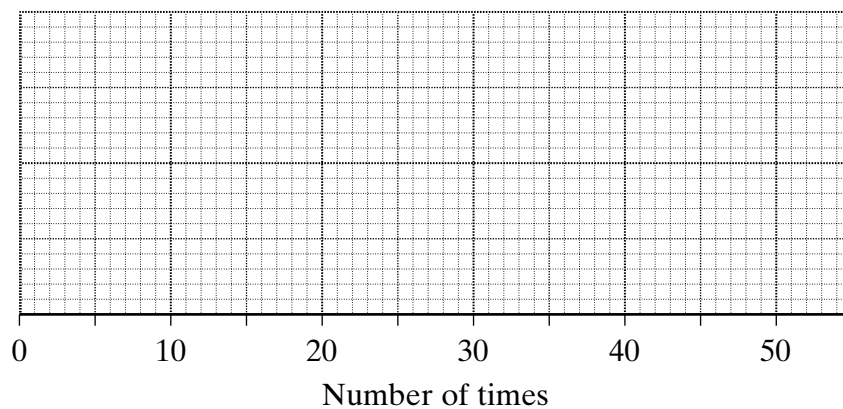
4

**Turn over** ▶

**8** The manager of a gym recorded the number of times that sun-beds were used each day in January.

The table shows a summary of his results.

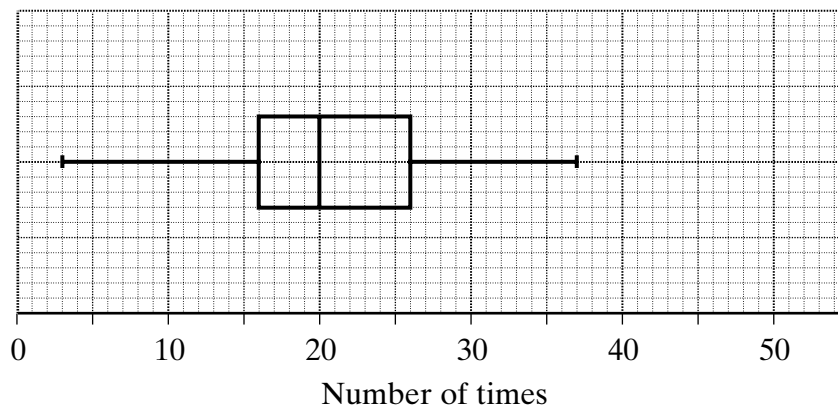|  | **Number of times** |
| --- | --- |
| Minimum | 16 |
| Lower quartile | 23 |
| Median | 28 |
| Upper quartile | 33 |
| Maximum | 40 |

(a) Draw a box plot to show these results.

**JANUARY**

Number of times

*(3 marks)*

(b) The number of times that the sun-beds were used each day in June is summarized in the box plot below.

**JUNE**

Number of times

Write down **two** differences between the box plots.

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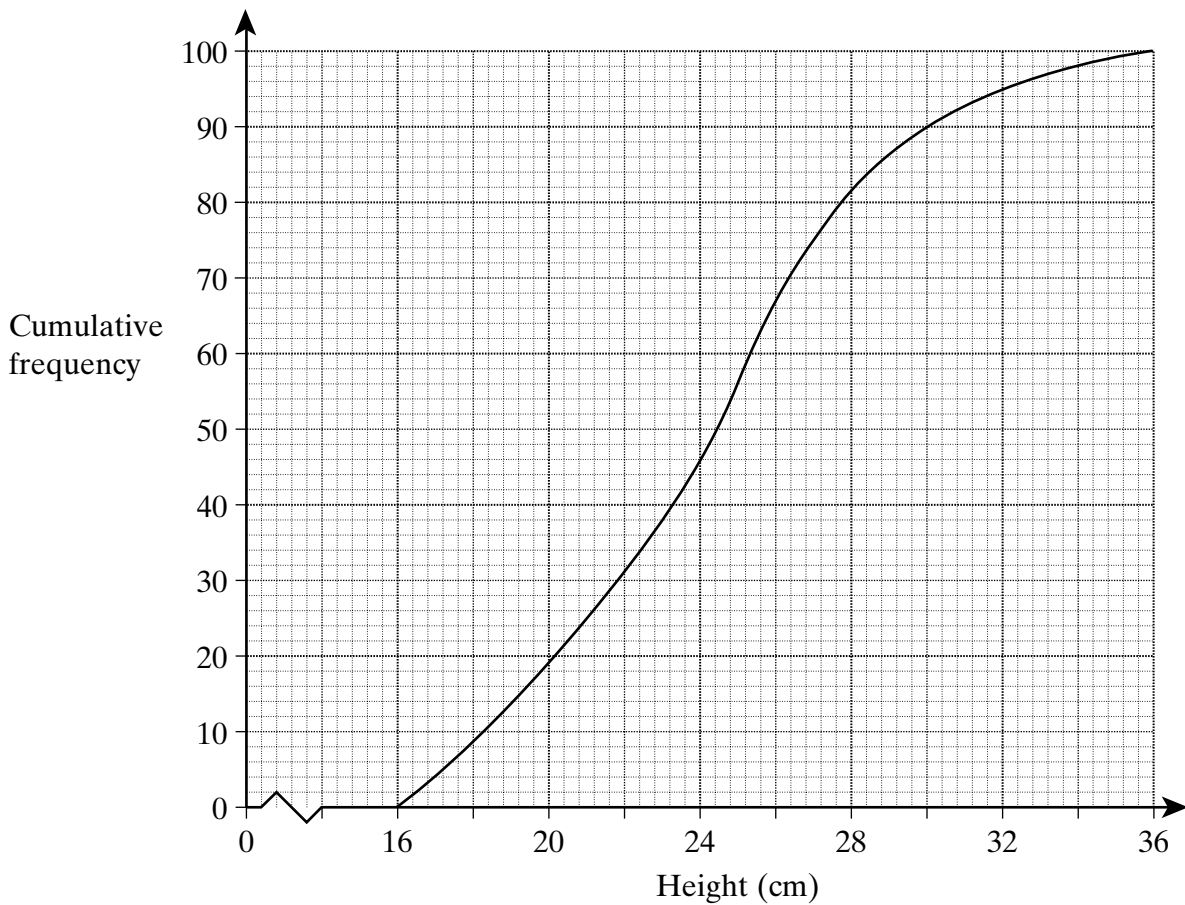
*(2 marks)*

5

**TURN OVER FOR THE NEXT QUESTION**

**Turn over ▶**

**9**  The cumulative frequency diagram shows the heights, in centimetres, of 100 plants.



Use the cumulative frequency diagram to estimate

(a)  the number of plants with a height less than 25 cm,

Answer ........................................................  *(1 mark)*

(b)  the interquartile range of the heights of the plants.

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Answer ............................................................... cm  *(2 marks)*

**END  OF  QUESTIONS**

3