

1. Fred did a survey on the areas of pictures in a newspaper. The table gives information about the areas.

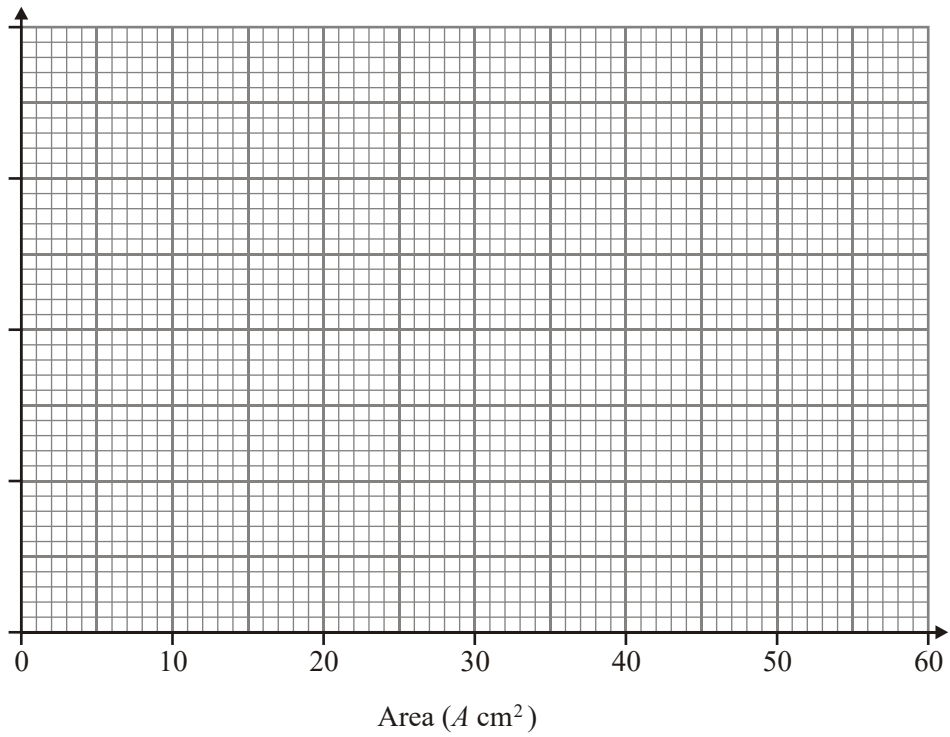
Area ($A \text{ cm}^2$)	Frequency
$0 < A \leq 10$	38
$10 < A \leq 25$	36
$25 < A \leq 40$	30
$40 < A \leq 60$	46

- (a) Work out an estimate for the mean area of a picture.

..... cm^2

(4)

- (b) Draw a histogram for the information given in the table.



(3)
(Total 7 marks)

2. The table shows information about the number of hours that 120 children used a computer last week.

Number of hours (h)	Frequency
$0 < h \leq 2$	10
$2 < h \leq 4$	15
$4 < h \leq 6$	30
$6 < h \leq 8$	35
$8 < h \leq 10$	25
$10 < h \leq 12$	5

Work out an estimate for the mean number of hours that the children used a computer.
Give your answer correct to 2 decimal places.

..... hours
(Total 4 marks)

01. (a) $38 \times 5, 36 \times 17.5, 30 \times 32.5, 46 \times 50$
(= 190, 630, 975, 2300)

$$\Sigma fx = 190 + 630 + 975 + 2300 = 4095$$

$$\text{Mean } \Sigma fx / \Sigma f = 4095/150$$

$$27.3$$

4

M1 for fx with x within intervals (including ends) at least two consistently

M1 (dep) for fx consistently using midpoints

M1 (dep on 1st M) for use of $\Sigma fx / \Sigma f$

A1 for 27.3 cao

(b) Frequency density (number of pictures per cm^2)

e.g.

Width 0 to 10 height of rectangle $3.8(k)$

Width 10 to 25 height of rectangle $2.4(k)$

Width 25 to 40 height of rectangle $2(k)$

Width 40 to 60 height of rectangle $2.3(k)$

Bars with correct heights, widths, label and scaling

3

B2 for 4 rectangles with correct widths and heights

(B1 for 3 rectangles with correct widths and heights)

B1 for correct label or key and consistent scaling

(SC if 0/3 award M1 if clearly using area or freq. density)

[7]

02. 6.08

4

$$(1 \times 10) + (3 \times 15) + (5 \times 30) + (7 \times 35) +$$

$$(9 \times 25) + (11 \times 5) = 730$$

$$"730" \div 120 = 6.08333$$

M1 for use of fx with x consistent within intervals (including end points)

M1 (dep) for use of midpoints

M1 (dep on 1st M1) for use of $\frac{\sum fx}{\sum f}$

A1 6.08 to 6.085

[4]

01. Many candidates were able to use a value from within each class interval to calculate $\sum fx$, but multiplications and additions were often careless. Some were confused about the midpoints 17.5 and 32.5 and these were often rounded to an integer. Having calculated $\sum fx$ correctly, some went on to divide by 4, whilst others divided by the sum of the midpoints.

In part (b), a significant proportion of candidates did not know how to draw a histogram. This was usually given as a bar chart or frequency polygon. A large number of candidates did not gain the mark for labelling the vertical axis or giving a key.

02. This was poorly done and a notable deterioration in performance, to that of recent years. $120 \div 6 = 20$ and $36 \div 6 = 6$ were the most common mistakes made, usually by weaker candidates, while those who showed some understanding of the method often either made arithmetic errors or errors in their use of the grouped data (time), taking the upper or lower limits of the ranges instead of the mid-points. It was not uncommon to see the $\sum fx$ evaluated correctly to 730 followed by division by 6, instead of 120.