HIGHER TIER
MINI PRACTICE EXAM 9

CALCULATOR ALLOWED
20 MINUTES ALLOWED

metatutor

1.
The frequency table below shows the marks scored by a class of students in a maths test.

Mark (out of 100)	Frequency	MP	FxMP	CF
$0 < x \leq 20$	2	10	20	2
$20 < x \leq 40$	11	30	330	13
$40 < x \leq 60$	7	50	350	20
$60 < x \leq 80$	6	70	420	26
$80 < x \leq 100$	4	90	360	30

(a) Estimate the mean mark. Give your answer to the nearest whole number.

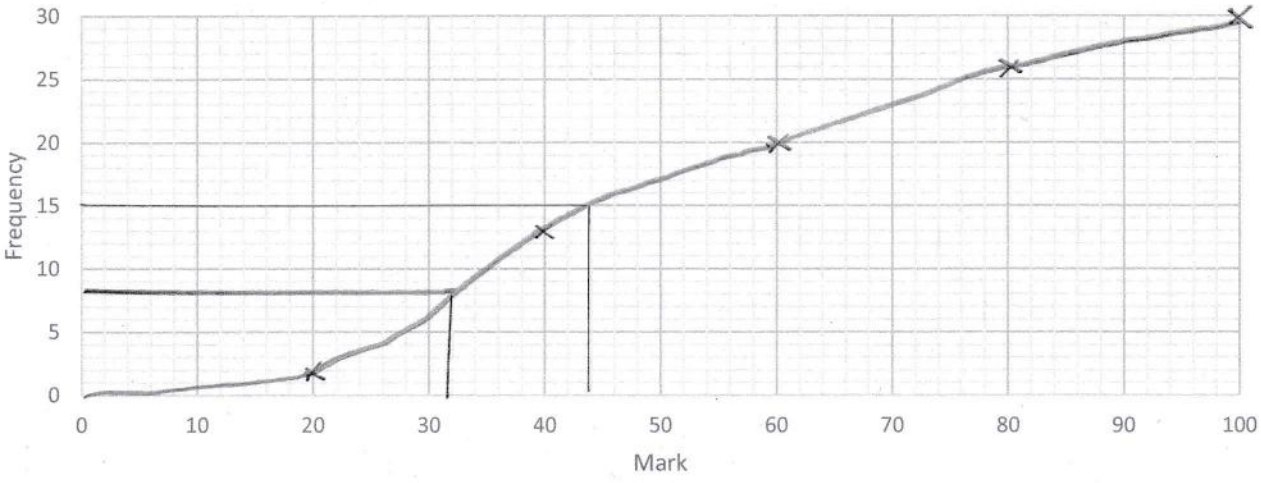
$20+330+350+420+360=1,480$

$2+11+7+6+4=30$

$1,480 \div 30 = 49.3 = \underline{49}$

(4)

(b) On the axis below, plot a cumulative frequency graph of the results.



(2)

(c) Use your cumulative frequency graph to estimate the median mark.

44

(1)

(d) The pass mark for the test was 32 marks.
Use your cumulative frequency graph to estimate what percentage of the class passed the test. Give your answer to the nearest percent.

$\frac{8}{30} \times 100 = 26.6\% = 27\%$

$100-27 = \underline{73\%}$

(2)

2.
The first four terms of a quadratic sequence are 3, 6, 13 and 24.

Find the nth term of the sequence.

3 6 13 24

3 7 11

4 4

$2n^2 - 3n + 4$

seq	3	6	13	24
$2n^2$	2	8	18	32
dif	1	-2	-5	-8

$-3n + 4$

(3)

3.
Find the co-ordinates of the minimum point of the graph $y = x^2 - 7x + 12$.

$x^2 - 7x + 12 = (x - 7/2)^2 - (7/2)^2 + 12$

$= (x - 7/2)^2 - 49/4 + 48/4$

$= (x - 7/2)^2 - 1/4$

$(7/2, -1/4)$

(4)

4.
A bag contains blue and green marbles.
To begin with, there were 20 more green marbles than blue marbles.
30 blue marbles and 40 green marbles are then removed from the bag, leaving the ratio of blue to green marbles as 3 : 8.

How many marbles were in the bag to begin with?

b = blue
g = green

b : g

Before: b : b+20

After: b-30 : b+20-40

b-30 : b-20

3 : 8

$\frac{b-30}{3} = \frac{b-20}{8}$

$8(b-30) = 3(b-20)$

$8b - 240 = 3b - 60$

$5b = 180$

$b = 36$

$g = 36 + 20 = 56$

(4)

$36 + 56 = 92$