Paper Reference(s)

5523/03

Edexcel GCSE

Mathematics A – 1387

Paper 3 (Non-Calculator)

Intermediate Tier

Tuesday 8 November 2005 – Morning

Time: 2 hours

Examiner's use only

Team Leader's use only

Materials required for examination	**Items included with question papers**
Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser. Tracing paper may be used.	Nil

Instructions to Candidates

In the boxes above, write your centre number, candidate number, your surname, initials and signature.
Check that you have the correct question paper.
Answer **ALL** the questions in the spaces provided in this question paper.
You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.
If you need more space to complete your answer to any question, use additional answer sheets.

Information for Candidates

The marks for individual questions and the parts of questions are shown in round brackets: e.g. **(2)**.
There are 26 questions in this question paper. The total mark for this paper is 100.
There are 20 pages in this question paper. Any blank pages are indicated.
Calculators must not be used.

Advice to Candidates

Show all stages in any calculations.
Work steadily through the paper. Do not spend too long on one question.
If you cannot answer a question, leave it and attempt the next one.
Return at the end to those you have left out.

Turn over
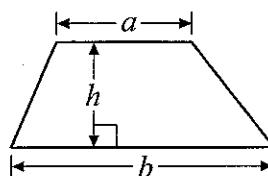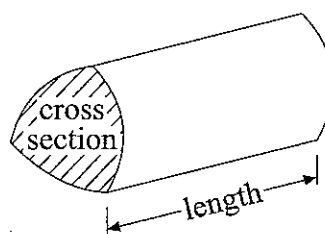
edexcel

Formulae: Intermediate Tier

You must not write on this formulae page.
Anything you write on this formulae page will gain NO credit.

Area of trapezium $= \frac{1}{2}(a+b)h$

Volume of prism = area of cross section × length

Answer ALL TWENTY SIX questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1. The table gives information about the number of goals scored by a football team in each match during a season.

Number of goals	Number of matches
0	9
1	8
2	12
3	5

Work out the total number of goals scored by the football team during the season.

....

(Total 2 marks)

Q1

2. A cuboid has

        a volume of 40 cm^3
        a length of 5 cm
        a width of 2 cm

(a) Work out the height of the cuboid.

.......................cm

(2)

(b)
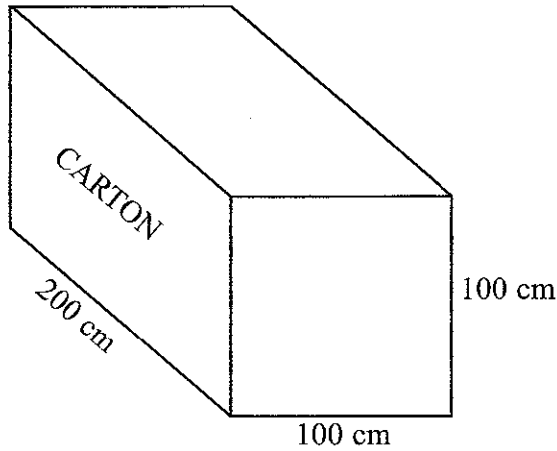
Diagrams **NOT**
accurately drawn

CARTON

200 cm

100 cm

100 cm

BOX
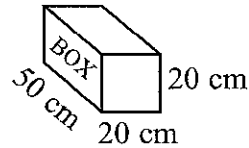
50 cm

20 cm

20 cm

A carton measures 200cm by 100cm by 100cm.

The carton is to be completely filled with boxes.

Each box measures 50cm by 20cm by 20cm.

Work out the number of boxes which can completely fill the carton.

....

(3)

(Total 5 marks)

3. In the diagram, Point A marks the position of Prestwich.
The position of Radcliffe is to be marked on the diagram as *Point B*.

(a) On the diagram, mark with a cross (×) the position of *B*, given that
    B is on a bearing of 320° from A and
    B is 6 cm from *A*.

N

↑

|
|
|

✕
A

(2)

The scale of the diagram is 1 : 50 000

(b) Work out the real distance 6 cm represents.
    Give your answer in kilometres.

.....................km

(3)

(Total 5 marks)

4. Pat writes down two sums.

$$1 + 2 = 3$$

$$7 + 8 = 15$$

Pat says

'The sum of two whole consecutive numbers is never a square number'.

Give an example to show that Pat is **wrong**.

....

(Total 2 marks)

5. The cost of a compact disc holder is 25p.
John has £15 to spend.

(a) What is the greatest number of compact disc holders that John can buy for £15?

....

(3)

A compact disc player costs £50 plus 17½% VAT.

(b) Calculate the total cost of the compact disc player.

Compact disc player
£50 + VAT

£.....................................

(3)

(Total 6 marks)

N 1 6 9 3 4 A 0 6 2 0
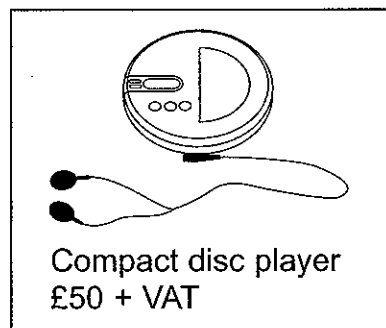
6. The diagram shows a 6-sided shape made from a rectangle and a right-angled triangle.

Diagram **NOT** accurately drawn

2 cm

7 cm

12 cm

6 cm
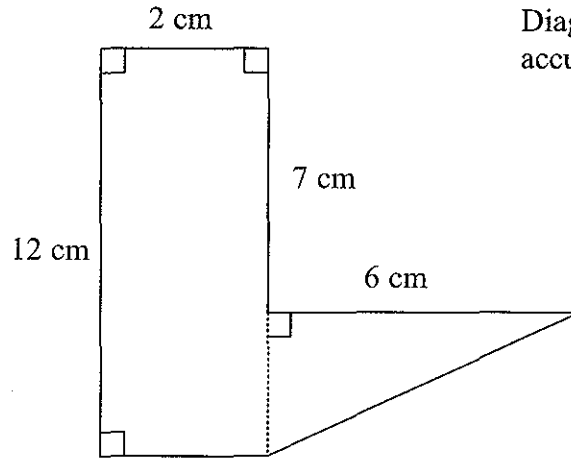
Work out the total area of the 6-sided shape.

.............................cm² **Q6**

(Total 3 marks)

7. Change 50 000 mm² to cm².

.............................cm² **Q7**

(Total 2 marks)

8. 10 students each took a French test and a German test.
The table shows their marks.

French marks	44	30	40	50	14	20	32	34	20	45
German marks	48	35	45	54	18	22	36	38	25	50

(a) Complete the scatter graph to show the information in the table.
The first 8 points in the table have been plotted for you.

(1)

German mark
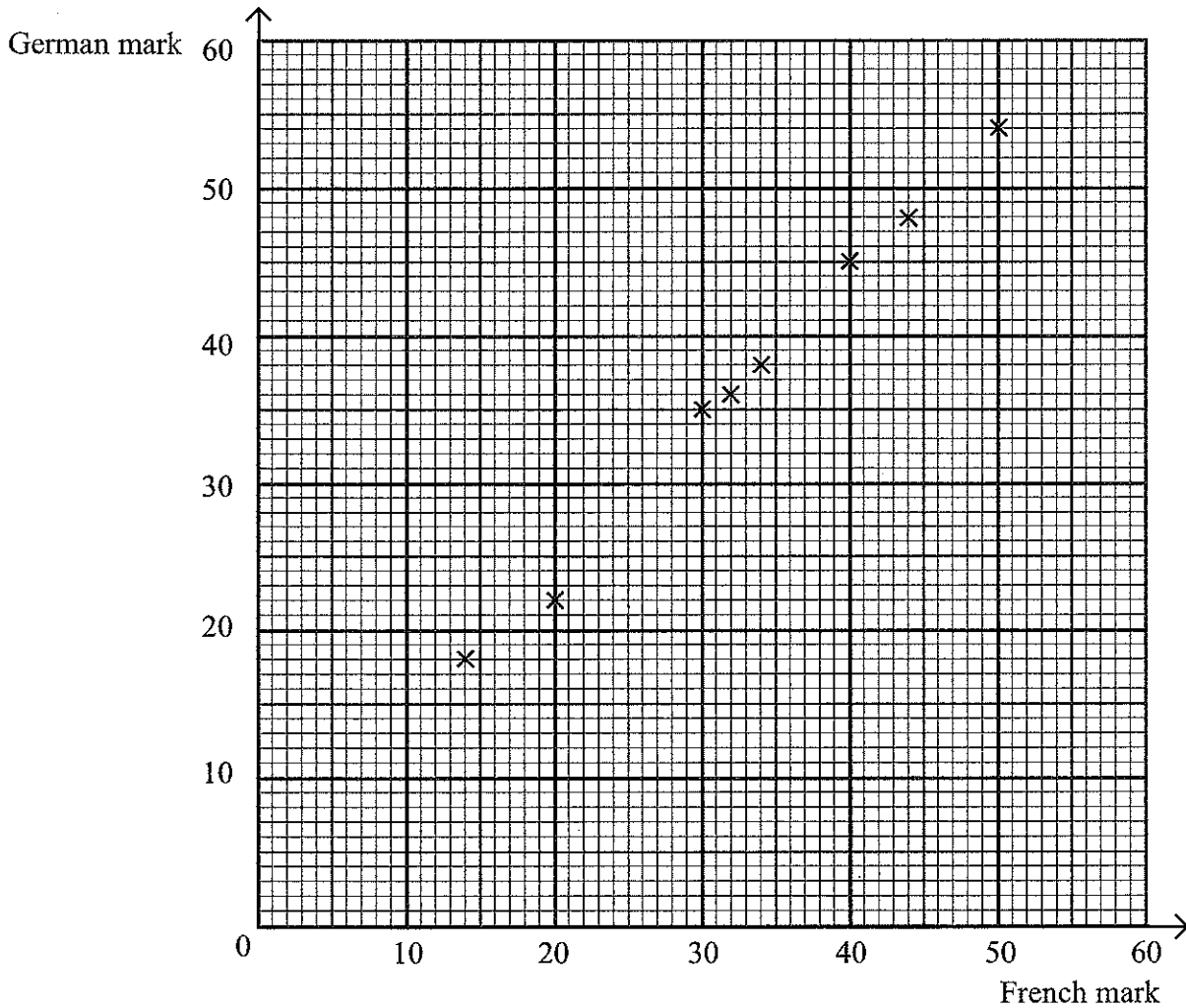
French mark

(b) What type of correlation does this scatter graph show?

....

(1)

(c) Draw a line of best fit on the scatter diagram.

(1)

(d) Use your line of best fit to estimate

(i) the German mark for a student with a French mark of 26,

....

(ii) the French mark for a student with a German mark of 43.

....

(2) Q8

(Total 5 marks)

9.

Cinema Ticket Prices	
Adults	£4
Child	£3

An adult ticket costs £4.
A child ticket costs £3.

(a) Write down a formula for the total cost, £T, for n adult tickets and c child tickets.

....

(3)

Hina spends £47 on cinema tickets.
She buys 8 adult tickets.

(b) Work out how many child tickets she buys.

....

(3) Q9

(Total 6 marks)

10. (a) Simplify $4a + 5b - 3b + a$

....
(2)

(b) Simplify $x^3 + x^3$

....
(1)

(c) Factorise $x^2 - 3x$

....
(2)

(Total 5 marks)

11. Some students each chose one PE activity.

$\dfrac{1}{5}$ of the students chose swimming.

$\dfrac{3}{8}$ of the students chose tennis.

All the rest of these students chose cricket.

What fraction of the students chose cricket?

....

(Total 3 marks)

12.

> **Canal boat for hire**
> **£1785.00**
> **for 14 days**

(a) What is the cost **per day** of hiring the canal boat?

£.........................

(3)

Jenny and Kath hire the canal boat for 14 days.
They share the hire cost of £1785.00 in the ratio 2:3

(b) Work out the smaller share.

£.........................

(2)

Q12

(Total 5 marks)

13. A school snack bar offers a choice of four snacks.
The four snacks are burgers, pizza, pasta and salad.
Students can choose **one** of these four snacks.

The table shows the probability that a student will choose burger or pizza or salad.

Snack	burger	pizza	pasta	salad
Probability	0.35	0.15		0.2

One student is chosen at random from the students who use the snack bar.

(a) Work out the probability that the student

(i) did **not** choose salad,

....

(ii) chose pasta.

....

(3)

300 students used the snack bar on Tuesday.

(b) Work out an estimate for the number of students who chose pizza.

....

(2)

(Total 5 marks)

Q13

14. Emma repairs bicycles.
She keeps records of the cost of the repairs.

The table gives information about the costs of all repairs which she carried out in one week.

Cost (£C)	Frequency
$0 < C \leqslant 10$	3
$10 < C \leqslant 20$	7
$20 < C \leqslant 30$	6
$30 < C \leqslant 40$	8
$40 < C \leqslant 50$	9

Find the class interval in which the median lies.

....

(Total 2 marks)

Q14

15.

A
×

B
×

×
C

Jill rolls a ball from point C.
At any point on its path, the ball is the same distance from point A and point B.

(a) On the diagram above, draw accurately the path that the ball will take.

(2)

(b) On the diagram, shade the region that contains all the points that are no more than 3 cm from point B.

(2) Q15

(Total 4 marks)

16. Work out an estimate for the value of

$$\frac{5.79 \times 312}{0.523}$$

Q16

....

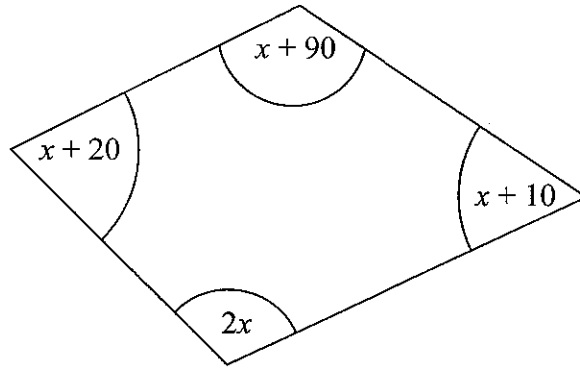**(Total 3 marks)**

17.

$x + 90$

$x + 20$

$x + 10$ Diagram **NOT**
accurately drawn

$2x$

The sizes of the angles, in degrees, of the quadrilateral are

$x + 10$
$2x$
$x + 90$
$x + 20$

(a) Use this information to write down an equation in terms of x.

....

(2)

(b) Use your answer to part (a) to work out the size of the smallest angle of the quadrilateral.

.... °
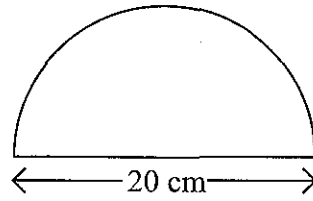
(3)

Q17

(Total 5 marks)

18.

Diagram **NOT** accurately drawn

←——20 cm——→

A semicircle has a diameter of 20 cm.

Work out the perimeter of the semicircle.
Take the value of π to be 3.14

......................cm

(Total 3 marks)

19. (a) Write the number 40 000 000 in standard form.

....

(1)

(b) Write 1.4×10^{-5} as an ordinary number.

....

(1)

(c) Work out

$$(5 \times 10^4) \times (6 \times 10^9)$$

Give your answer in standard form.

....

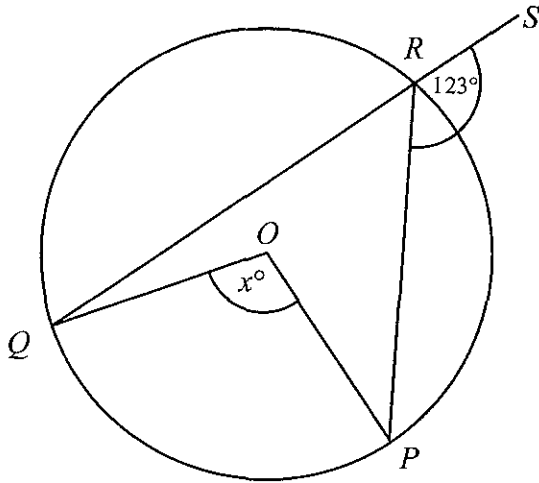**(2)**

(Total 4 marks)

N 1 6 9 3 4 A 0 1 5 2 0

20.

Diagram **NOT** accurately drawn

QRS is a straight line.
QR and *PR* are chords of a circle, centre *O*.
Angle *PRS* = 123°.
Angle *QOP* = *x*°.

Calculate the size of the angle marked *x*°.
Give reasons for your answer.

..............................°

Q20

(Total 3 marks)

---

21. Here are some expressions.

$\dfrac{\pi r^3}{x}$	$\dfrac{r^3}{\pi}$	$\pi x + r$	$\pi r^2 + rx$	$\pi(x+r)$	$\dfrac{\pi^3}{x^2}$

The letters *r* and *x* represent lengths. π is a number that has no dimensions.

Tick (✔) the boxes underneath the **two** expressions that can represent areas.
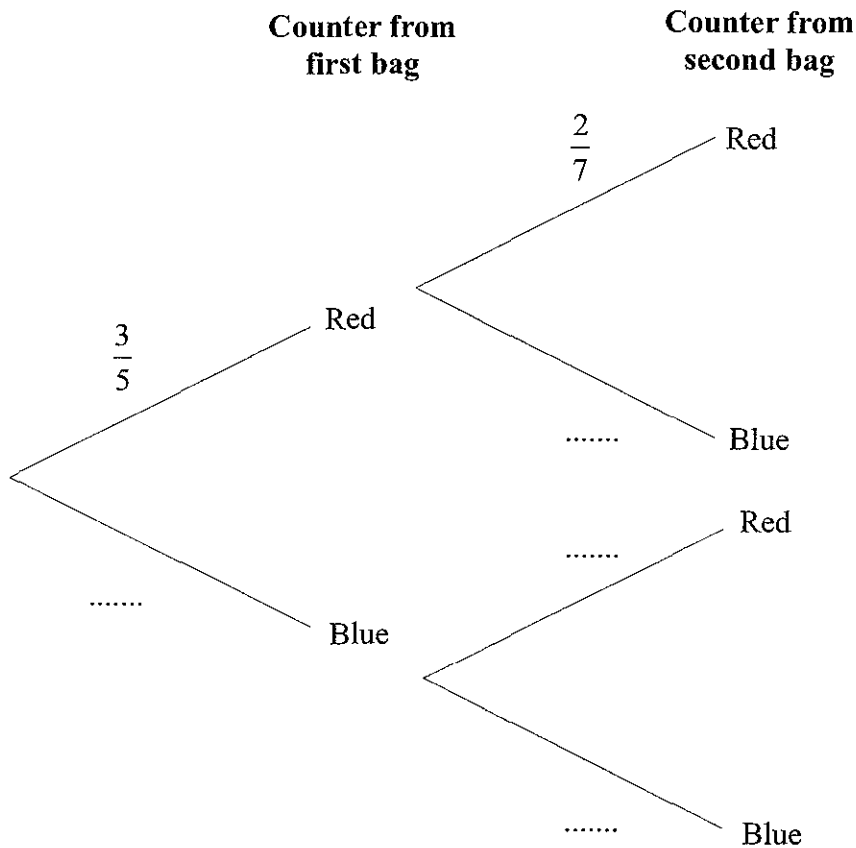
Q21

(Total 2 marks)

N169 34A01620

22. Loren has two bags.
The first bag contains 3 red counters and 2 blue counters.
The second bag contains 2 red counters and 5 blue counters.

Loren takes one counter at random from each bag.

Complete the probability tree diagram.

Counter from first bag   **Counter from second bag**

$\frac{2}{7}$ Red

$\frac{3}{5}$ Red

...... Blue

...... Red

...... Blue

...... Blue

(Total 2 marks)

23. (a) Expand and simplify

$(x - y)^2$

....
(2)

(b) Rearrange $a(q - c) = d$ to make q the subject.

q = ...

(3)

(Total 5 marks)

24. Bill buys a new machine.
The value of the machine depreciates by 20% each year.

(a) Bill says "after 5 years the machine will have no value".
Bill is **wrong**.
Explain why.

....

....

....

(1)

Bill wants to work out the value of the machine after 2 years.

(b) By what single decimal number should Bill multiply the value of the machine when new?

....

(2)

(Total 3 marks)

Q24

25. 30 students took part in a National Science quiz.
The quiz was in two parts.
The cumulative frequency graph on the grid opposite gives information about the marks scored in Part One.
The lowest mark was 5 and the highest mark was 47.

(a) In the space provided on the grid draw a box plot using the cumulative frequency graph for the results of Part One.

(3)

The diagram also shows a box plot for the results of Part Two.
Use the box plots to compare the two distributions.

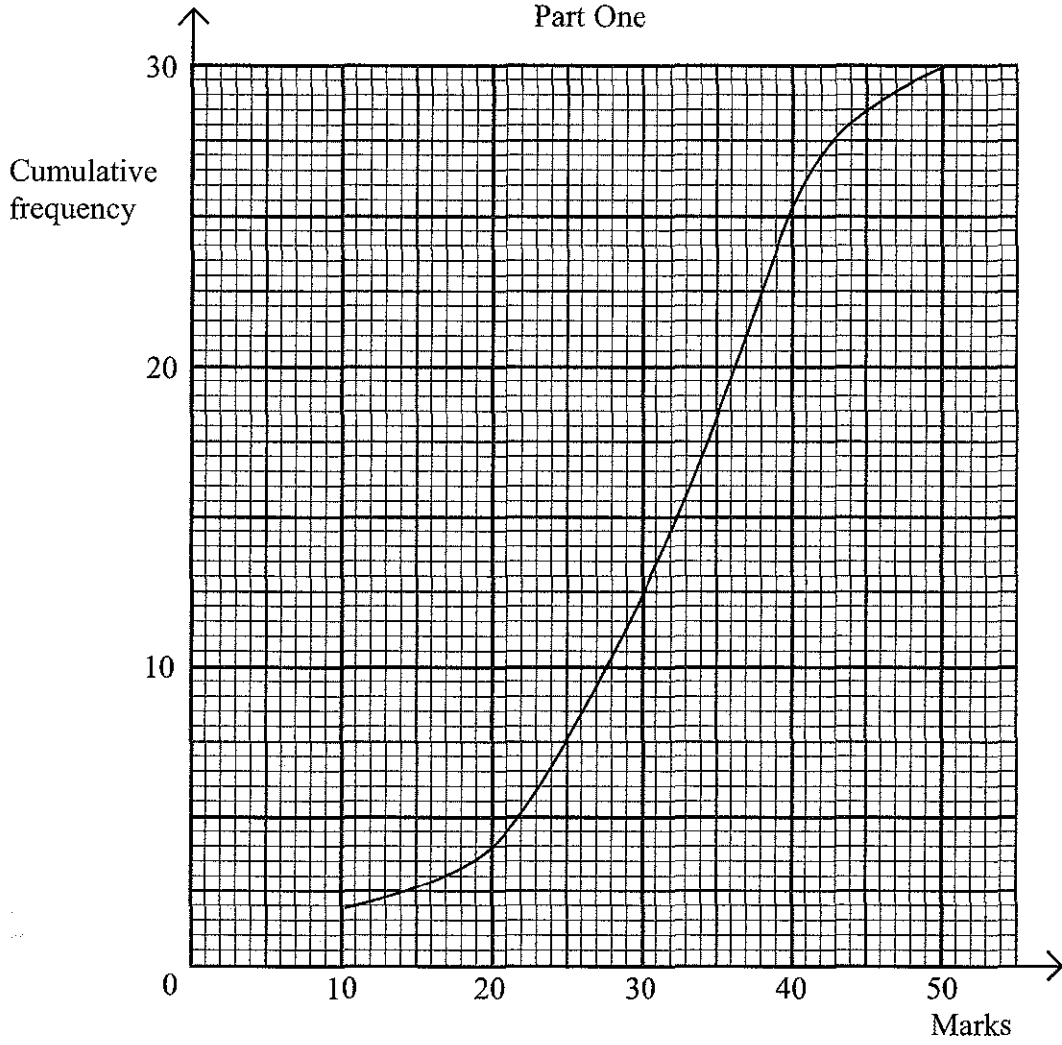(b) Give **two** differences between them.
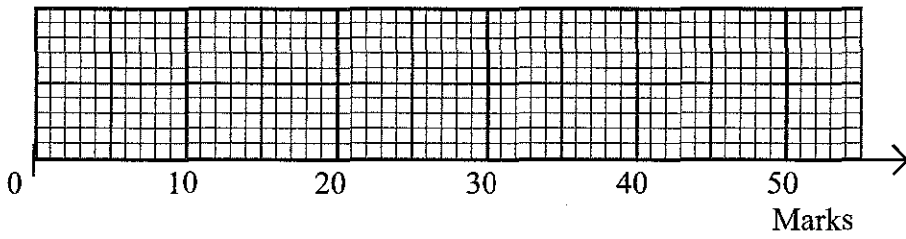
First difference ....

....

Second difference ....

....

(2)

Part One

Cumulative frequency

30

20

10

0   10   20   30   40   50

Marks

Part One

0   10   20   30   40   50

Marks

Part Two

0   10   20   30   40   50

Marks

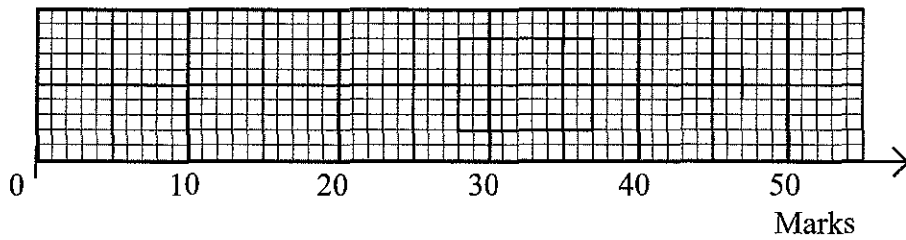**(Total 5 marks)**

26. A straight line has equation $y = 2x - 3$
The point P lies on the straight line.
The y coordinate of P is -4

(a) Find the x coordinate of P.

....

(2)

A straight line **L** is parallel to $y = 2x - 3$ and passes through the point (3,4).

(b) Find the equation of line **L**.

....

(3)

Q26

(Total 5 marks)

TOTAL FOR PAPER: 100 MARKS

END

N 1 6 9 3 4 A 0 2 0 2 0