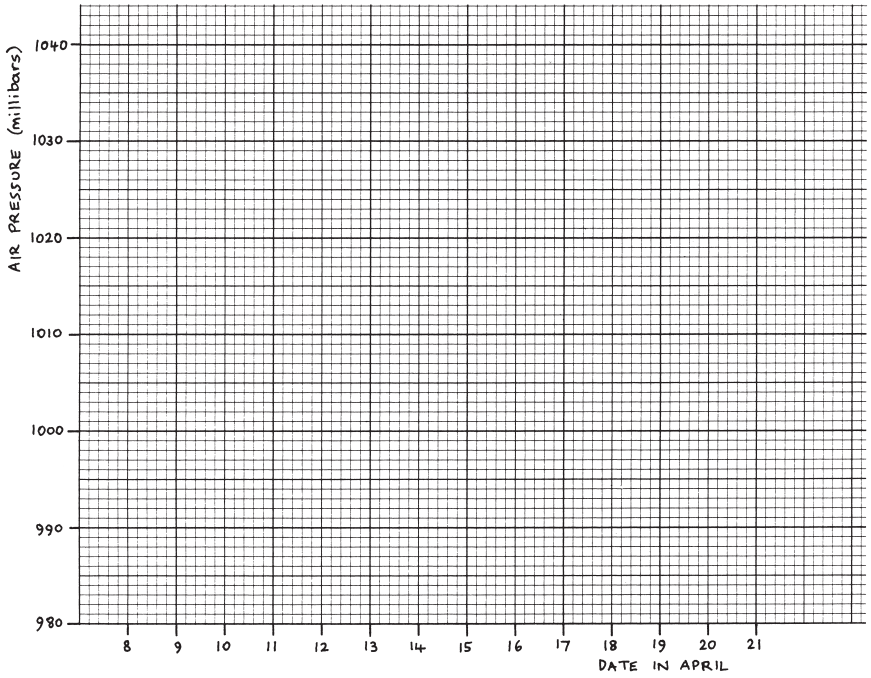
59 (a) Copy the axes shown below. Make sure that each axis is drawn along a thick graph line. Mark the axes with the correct names and numbers.

(b) The air pressure, in millibars, was measured with a barometer every day from 8th to 21st April.
The table on the right shows the dates and pressures.

(c) From the information in the table, plot points.
Start with the point (8,990) to show a pressure of 990mb on the 8th April. Then plot (9,982) and continue until all the points are correctly plotted.

(d) Join each point to the next with a straight line.
Then give your graph a title.

Date	Pressure (mb)
8	990
9	982
10	996
11	1012
12	1018
13	1016
14	1000
15	1000
16	1026
17	1032
18	1028
19	1018
20	1010
21	1014



60 A boy's height, in centimetres, at various ages is shown in the table on the right.

(a) On 2mm graph paper, draw axes for a graph.
Horizontal axis: AGE, 0 to 16 years, with 1cm to represent 1 year.
Vertical axis: HEIGHT (cm), 0 to 200cm, with 1cm to represent 20cm.

(b) On the vertical (HEIGHT) axis, what does each small square represent?

(c) Find the coordinates of each point by looking at the table. At age 0, the boy's height was 40cm. This gives the point (0,40). At age 2, his height was 56cm, giving the point (2,56), etc.

Age	Height (cm)
0	40
2	56
4	88
6	112
8	124
10	132
12	136
14	152
16	180

(d) Plot all the points. Then join each point to the next with a straight line.

(e) Between which two ages did the boy grow the fastest?

(f) Between which two ages did the boy grow the most slowly?

(g) From your graph, estimate the boy's height at
(i) 3 years of age.
(ii) 13 years of age.

61 The heights of the tide in the Severn Estuary were calculated for every third day in August, beginning on August 1. The dates and heights were

August 1 .....9.8m
August 4 .....10.7m
August 7 .....12.2m
August 10 .....13.1m
August 13 .....11.6m
August 16 .....10.0m
August 19 ....12.0m
August 22 ....13.3m
August 25 ....12.7m
August 28 ....10.3m
August 31 .....8.7m

Using graph paper with 2mm squares, draw axes for a graph.
Horizontal axis to show DATE (each day from August 1 to August 31, with two small squares for each day).

Vertical axis to show HEIGHT OF TIDE (metres) from 8.0m to 14.0m with 2cm (10 small squares) for 1.0 metre.

Plot points from the list above, starting with (1, 9.8). When all the points are plotted, join each point to the next to make a graph.

From the graph
(a) estimate the height of the tide on August 9.
(b) estimate the height of the tide on August 29.
(c) write down the dates when the height of the tide was approximately 11.0m.

62 The table below shows the total population (to the nearest 0.1 million) of the U.K., recorded at 20 year intervals from 1841.

Date	Population
1841	20.2 million
1861	24.5 million
1881	31.0 million
1901	38.2 million
1921	44.0 million
1941	—
1961	52.7 million
1981	55.8 million

(a) With horizontal axis for DATE (years) with 2cm to represent 20 years, and vertical axis for POPULATION (millions of people) from 20 million to 60 million with 4cm to represent 10 million people, plot points and join to make a graph.

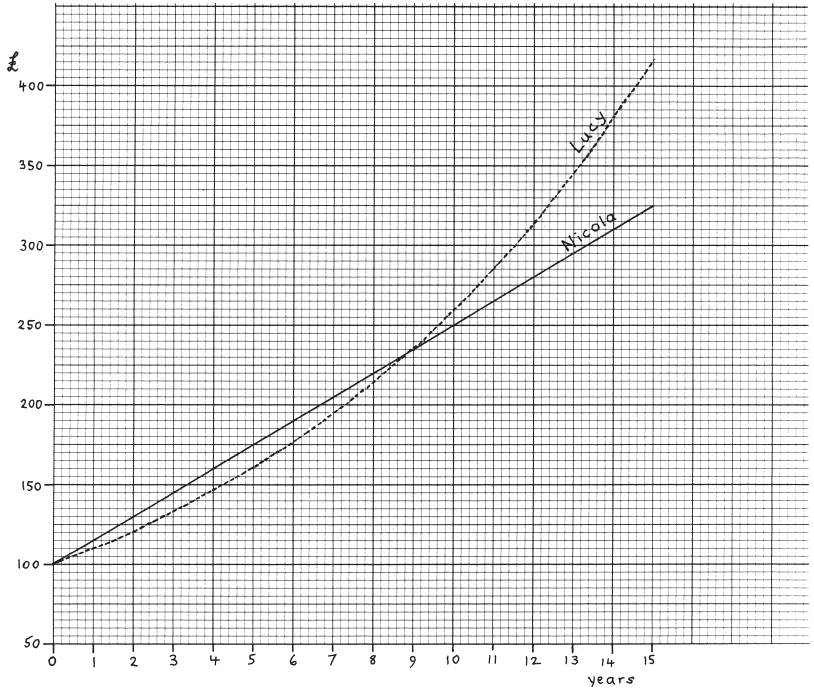
(b) In which period of 20 years did the population increase at the greatest rate?

(c) From the graph, estimate the population of the U.K. in
(i) 1891
(ii) 1911
(iii) 1941
(iv) 2001

(d) Why was the population not counted in 1941? (This is a question for history enthusiasts!)

63 Lucy put £100 into a savings account which paid 10% compound interest each year.
Nicola put £100 into a savings account which paid 15% simple interest each year.

The graph shows the amounts that Lucy's and Nicola's £100 would have grown to after 1, 2, 3, 4, etc., years. Lucy's is the broken curved line graph; Nicola's is the straight line graph.



From Lucy's graph, find
(a) the amount of her savings after 4 years.
(b) the amount of her savings after 9 years.
(c) how long she would have to wait before her savings doubled .
(d) how long she would have to wait before her savings trebled (X3).
(e) how much she would have in her account after 5 years if she had saved £250 instead of £100.

From Nicola's graph, find
(f) the amount of her savings after 3 years.
(g) the amount of her savings after 11 years.
(h) how long she would have to wait before her savings doubled.
(i) how long she would have to wait before her savings trebled.

From both graphs, find
(j) who would have the larger amount after 5 years, and how much more she would have.
(k) who would have the larger amount after 12 years, and how much more she would have.

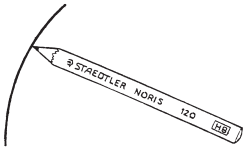
64 A glass of hot water was left to cool and the temperature of the water was measured every 10 minutes. The results are shown in the table.

Time (min)	Temperature (°C)
0	59.0
10	52.25
20	47.5
30	43.25
40	39.5
50	37.25
60	35.0
70	33.5
80	32.25
90	30.75
100	29.5
110	28.75
120	28.5

Draw axes for a graph.
Horizontal: TIME, 0 to 120 minutes with 1cm for 10 min.
Vertical: TEMPERATURE, 20°C to 60°C with 2cm for 5°C.

Plot points and join with a <u>smooth curve</u>.

NOTE. It is usually easier to draw a curve from <u>inside</u> the curve.



65 An elastic band 8.2cm long was hung from a hook and various masses were hung on the bottom of the band. The masses and lengths of band were noted.

Mass (g)	Length (cm)	Stretch (cm)
0	8.2	0
100	8.7	0.5
200	9.5	1.3
300	10.6	
400	11.6	
500	13.2	
600	14.9	
700	16.8	
800	19.0	
900	21.1	

(a) Copy and complete the table.
The stretch is found by subtracting 8.2cm from the length of the band each time, e.g. with 200g mass, the stretch is
9.5 − 8.2 = 1.3cm

(b) Draw a horizontal axis for MASS with 1cm to represent 100g.
Draw a vertical axis for STRETCH with 1cm to represent 1cm.
(c) Plot the points from the Mass and Stretch columns in the table.
Join the points as nearly as you can with a curved line.
(d) From the graph, estimate the stretch of the elastic band with a mass of
(i) 440g
(ii) 760g
(iii) 1000g

66 A mass was attached to the end of a piece of string to make a simple pendulum. The pendulum was then swung from side to side and the number of swings in ½ minute (30 seconds) was noted. The length of string was changed and the experiment was repeated. The results are shown in the table on the right.

Length of string (cm)	Swings in ½ minute
10	86
20	60
30	49
40	44
50	40
75	34
100	29
150	24
200	21

Draw axes for a graph.
Horizontal axis: LENGTH OF STRING (cm) with 2cm representing 25cm.
Vertical axis: SWINGS IN ½ MINUTE with 1cm representing 5 swings.
Plot the points from the table and join them as accurately as possible with a smooth curved line.