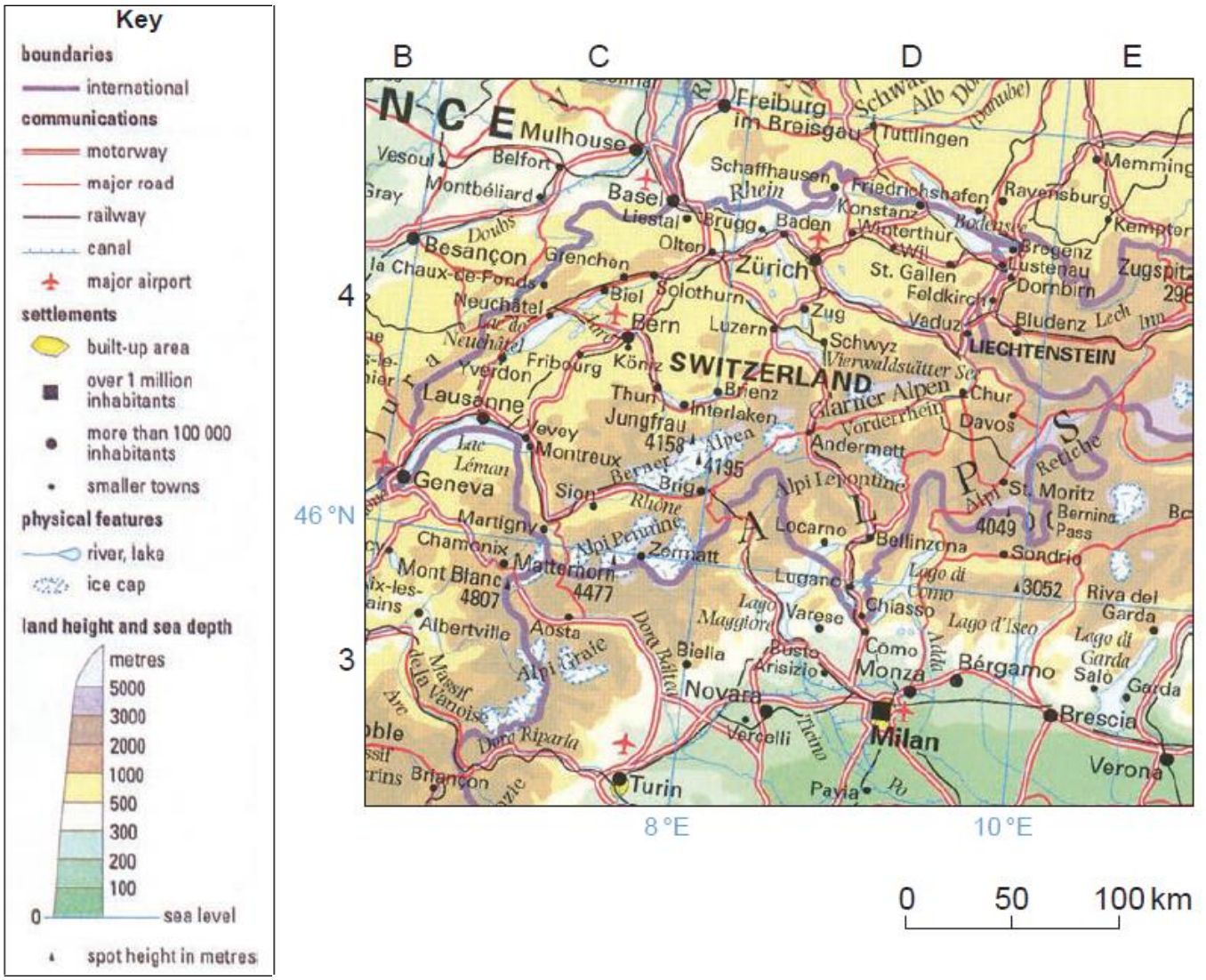
GCSE Skills Booklet Name: _____

Part A: Atlas maps



1a). Suggest why Switzerland is popular for Winter sports _____

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1b). What is the name and height of the highest mountain on this map? _____

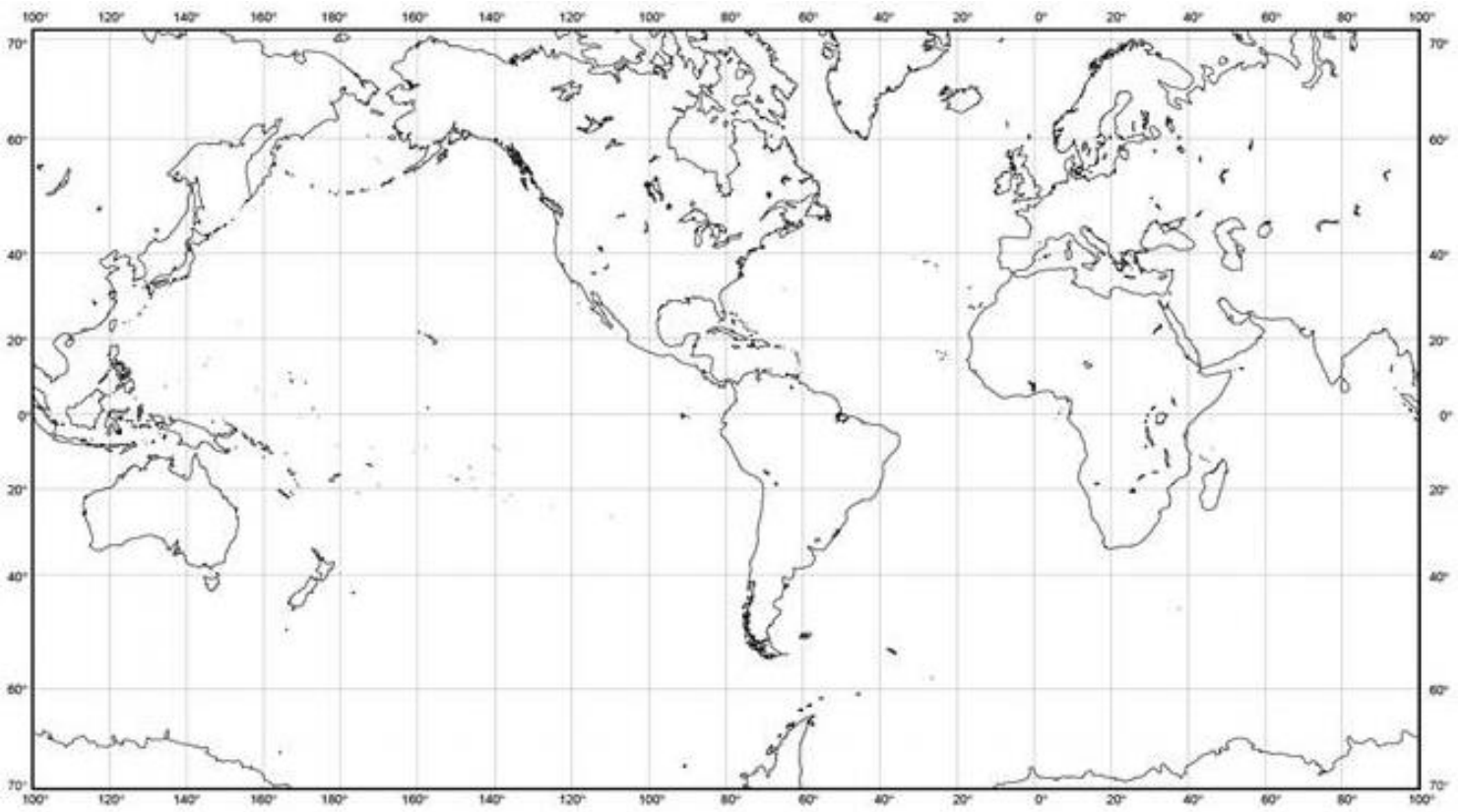
1c). What is the distance from Milan to Turin? _____

1d). In which square would you find Basel? _____

1e). How high above sea level is Zurich? _____

1f). What mountain range is shown on this map? _____

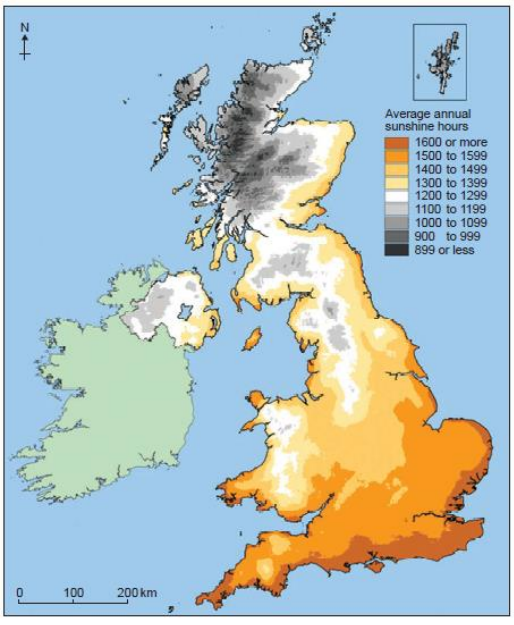
2. Latitude and Longitude



There are 14 cities listed in the table below. Plot them on the map with a dot and write the number of the city next to the dot:

1. Beijing: 40°N, 116°E	7. Nairobi: 1°S, 37°E
2. Cape Town: 34°S, 18°E	8. New York: 40°N, 74°W
3. Jakarta: 6°S, 106°E	9. Cairo: 30°N, 31°E
4. Los Angeles: 34°N, 118°W	10. Jakarta: 6°S, 106°E
5. Lima: 12°S, 77°W	11. Los Angeles: 34°N, 118°W
6. London: 51°N, 0°W	12. Rio de Janeiro: 23°S, 43°W
7. Moscow: 55°N, 37°E	13. Sydney: 34°S, 151°E
8. Mumbai: 19°N, 72°E	14. Tokyo: 35°N, 139°E

3. This map shows average annual sunshine hours in the UK between 1981 and 2010. Describe the pattern of average annual sunshine hours shown. (3)



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Part B: Ordnance Survey Maps

1km

1. What is the 4 figure reference for Kettle Hill? _____
2. What is the 4 figure reference for Bayfield Hall? _____
3. What is the 4 figure reference for Glandford Ford? _____
4. Find the 6 figure references for:

a). Windmill at Blakeney _____

b). The car park near Wiveton Downs _____

c. The church at Langham _____

5. What can be found at:

a). 009439 _____

b). 044438 _____

c). 012412 _____

6. What direction is Blakeney from Langham? _____

7. What direction is Glandford Ford from Morston? _____
8. What is the highest height displayed on the map? _____
9. What is the lowest height shown on the map? _____
10. Name one tourist attraction on this map _____

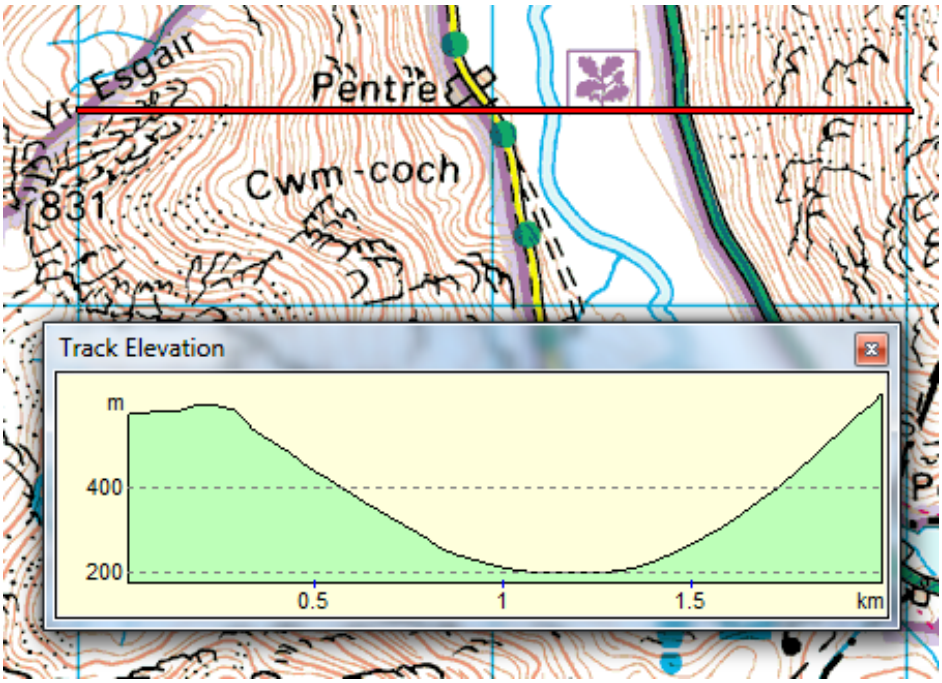
The scale on the map above is 2cm=1km

Given this, can you calculate these straight-line distances?:

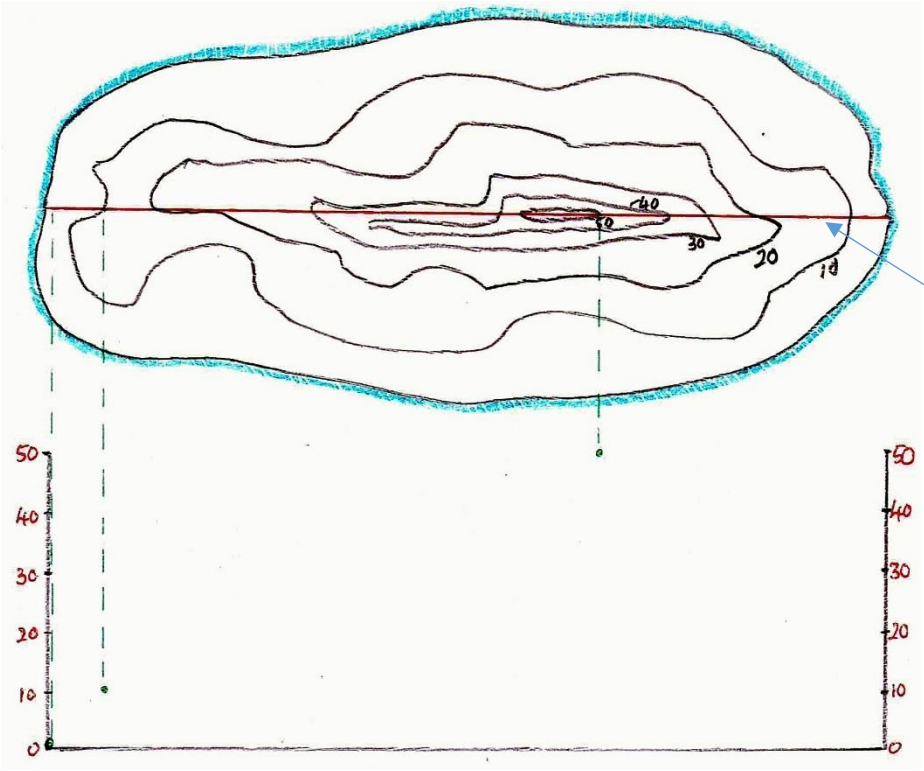
11. Langham church (008413) to Blakeney church (033436) _____
12. The distance between the bridges in grid squares 0443 and 0442 _____
13. The distance between the two car parks _____
14. You may need a piece of string for this, but can you calculate the distance along the road from Blakeney church to Morston church? _____
15. If you were to walk around the roads that appear to make a square around 'Langham Glass', how far would you go? _____

Task 16: Transect production

If you look at the diagram on the right, the red line has been drawn from one side of the valley to the other and then I have made the program display the elevation profile of this transect. You can see that there is a large hill to the west, it then flattens in the valley floor (no contours) and then increases in height to the eastern side of the transect. On the next page you will be shown how to draw one of these.



16). Now have a go at this worked example. I have started the process for you and provided a commentary:



1. I drew a relief map of a fictitious island (the blue shading represents the coast and therefore sea level (0m).

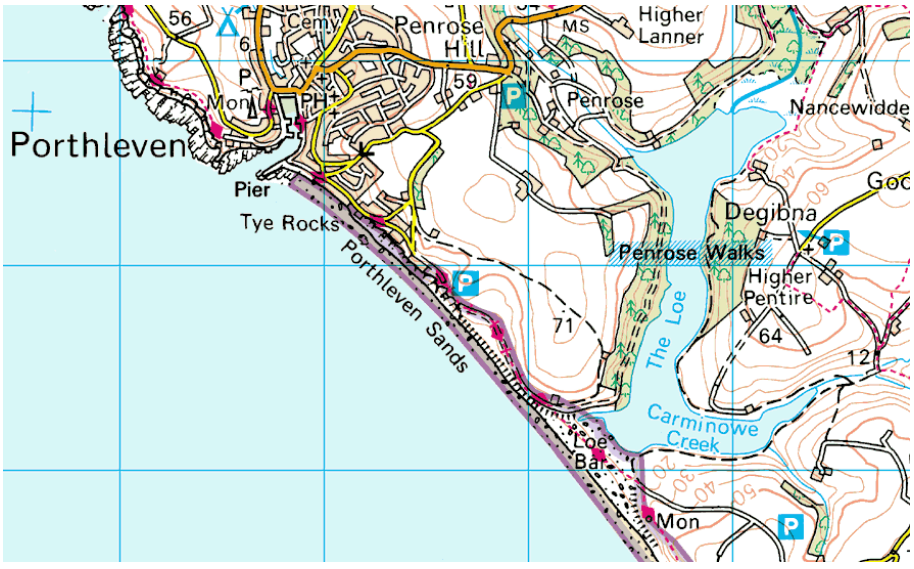
2. The red line is the transect that we are trying to turn into a relief transect/ cross section.

3. The pencil lines are the contours (I didn't have a brown pencil at home!) and you will see the height recorded next to them.

4. I scanned across the map and worked out that the highest height was 50 metres and the lowest height was 0 metres. This then enabled me to work out the range required for the Y axis on the graph below the map.

5. The X axis is as long as the map above it – the two Y axes match up to the start and finish of the red transect line.

6. As I moved from left to right along the red transect line every time I encountered a contour line I then worked out the height and then placed a dot on the graph below it. For example, on the graph above going from left to right the first contour was 0 metres. The dashed green line then shows where I put the 0 metre dot on the graph below that point. I have then done the same for the 10 metre contour. A little further on, I did the same for the 50 metre contour. You need to add all the dots and then connect the dots to produce a line graph. N.B. You don't need to draw dashed line like I have done; this was just to show you what I was doing!!



Task 17 - Physical feature identification on maps

17. Circle one erosion landform on this map and label it.

18. Circle one depositional landform on the map and label it.

Choose either one and explain how it is formed _____

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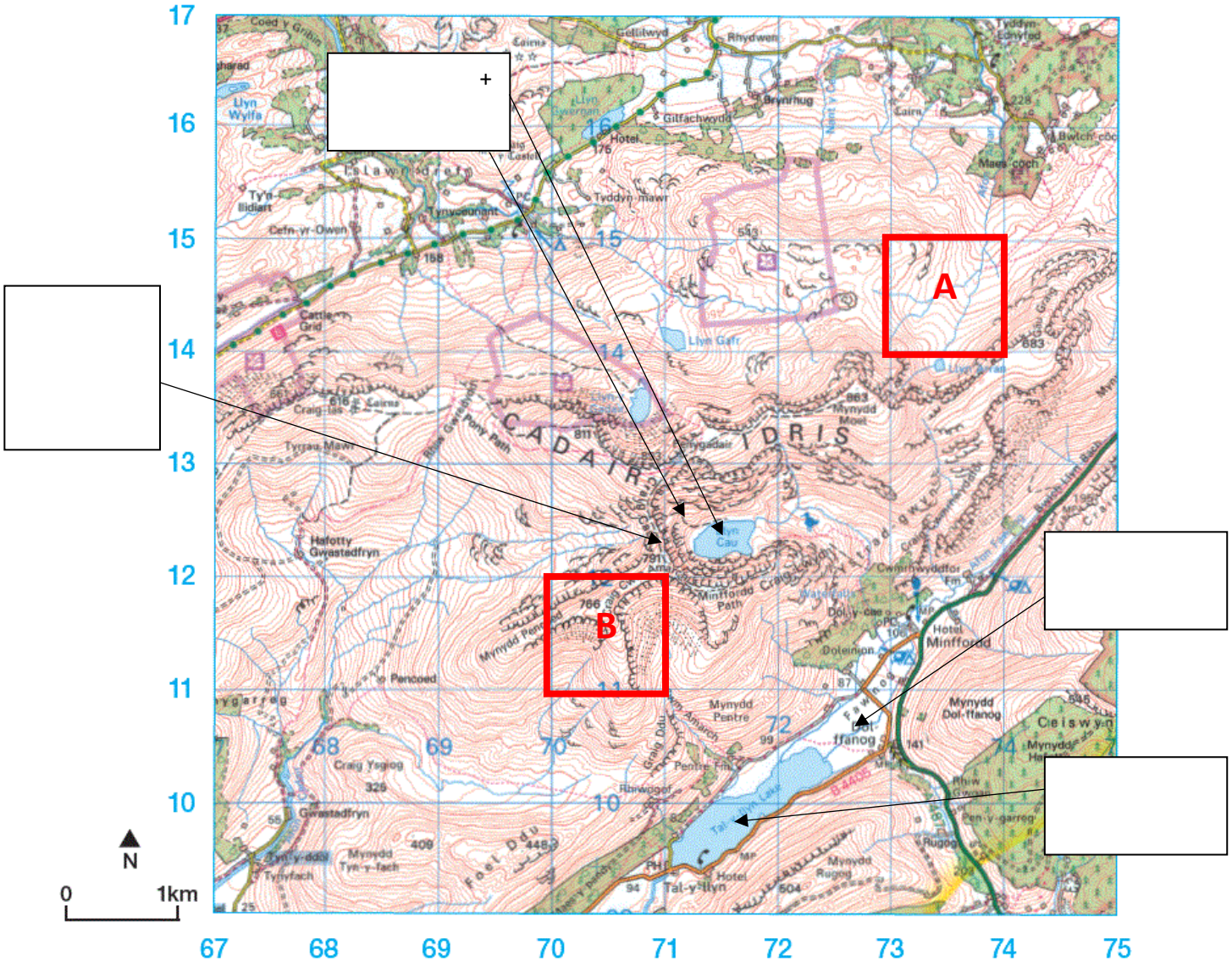

20. Which square – A or B – is steeper? _____

19. Fill in the boxes to identify glacial features on this OS map

Explain your decision _____

_____

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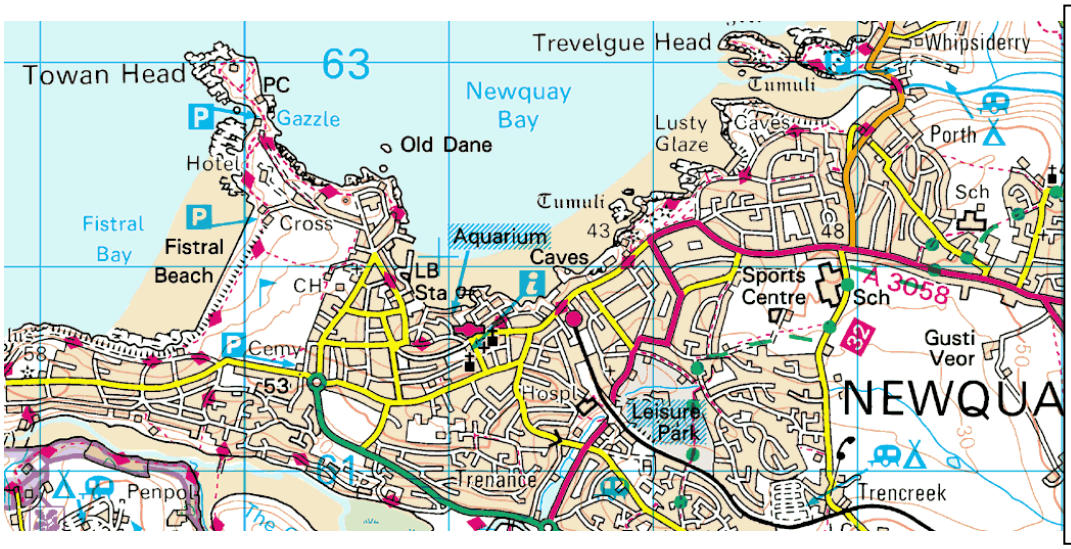


21. Infer human activity from maps

Coastlines offer opportunities for tourism. List 5 things from the map to suggest that tourists go there:

1.

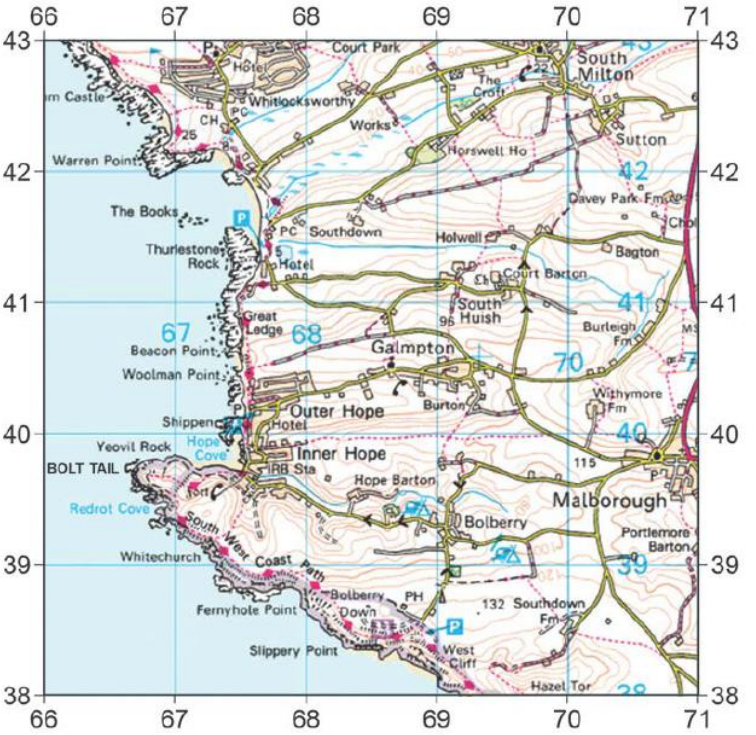
2.

3.

4.

5.

Part C: maps in association with photographs



Task 22. Linking photos and maps. Study the photograph above of Bolt Tail shown in grid square 6639 on the map on the left. Which direction was the photographer facing when she took the photo?

_____

Task 23. Sketch maps -The photo below shows East Head spit in West Sussex. You need to produce a sketch map (i.e. draw the main features in the space on the right. Label the key features, which would be: Groynes, spit, salt marsh, beach, estuary.

You also need to be able to interpret photos. Therefore, some key questions for this photo. Why are groynes used in this photo? What impact could they have on the future of the spit? Why has a salt marsh developed behind the spit?

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Task 24. Interpreting Satellite photos

Label some glacial features that you can see on this image of part of the Lake District (dark areas are often bodies of water)

Task 25. Mount Saint Helens – interpret satellite image task

A huge eruption here occurred in 1980. Describe the distribution of the impacts on the area surrounding the volcano.

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Task 26. Describing physical landscapes

Examine the photo on the left, which is a rainforest in Central Africa.

On the next page, describe **and** explain the main features shown

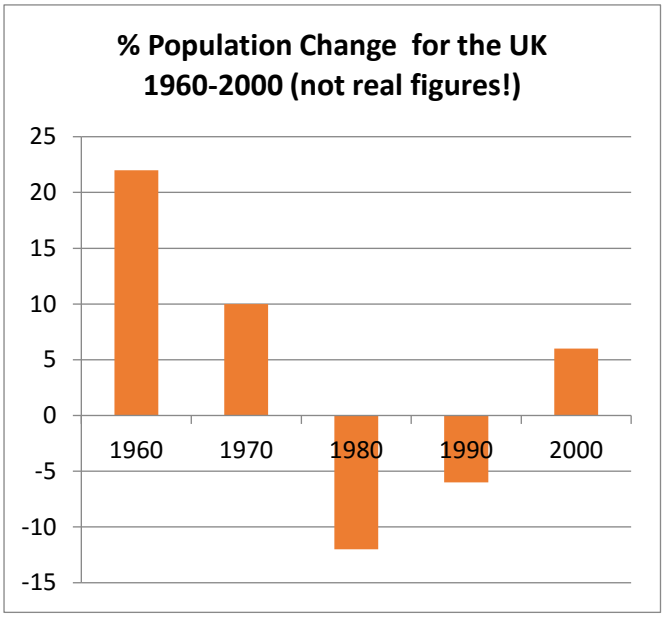
Task 27. Identification of land use from photos. Examine the aerial photo. Can you identify the city? _____

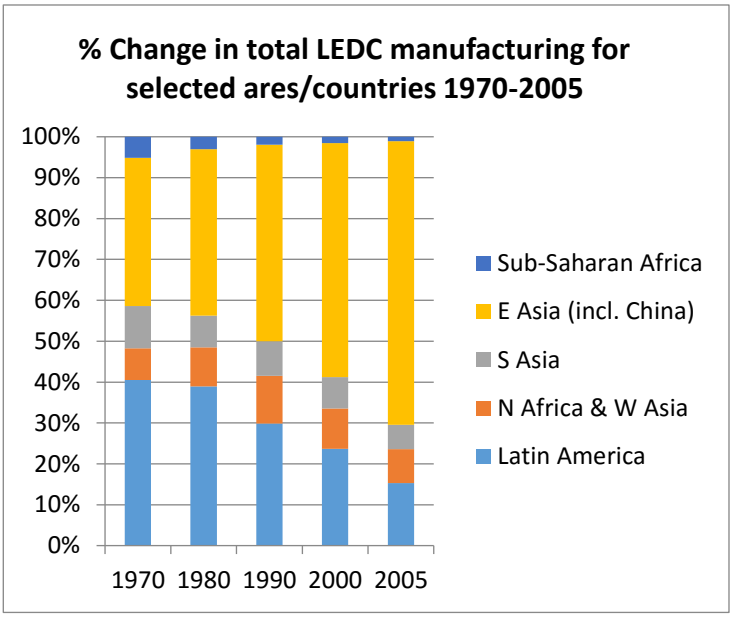
Your task is to annotate the photo to describe the land-use present.

Task 28. Sketching from a photo. Produce a sketch of this photo on the right. Label the following: wave cut platform, arch, stack, wave cut notch

Part D. Graphical skills

Task 29: Bar Graphs These are commonly used in exam papers. They can be simple, compound (stacked bar chart) or you could see one that shows positive and negative values. Examples are shown below:

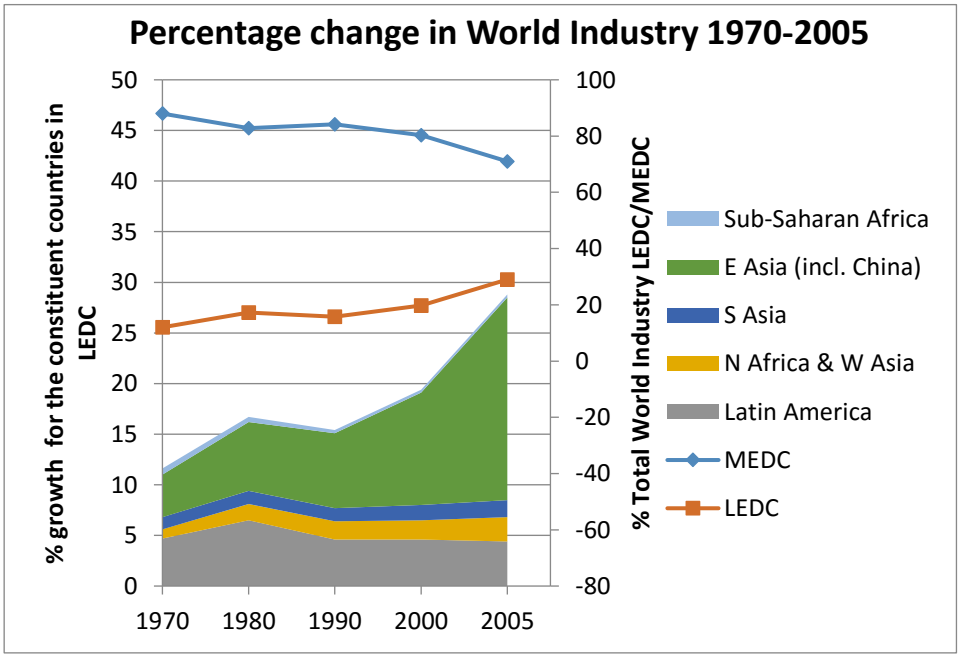




29). What was the % population change in 1960 _____, 1970 _____, 1980 _____, 1990 _____ & 2000 _____?

Line Graphs

This is a mixture of graph types! The MEDC/LEDC is plotted as a line graph and the value is plotted on the vertical axis (secondary axis). However, there is another type of graph plotted here called a compound line graph- this is where the differences between the points on the adjacent lines give the actual values- compound bar graphs are also common (see above)



30a). What was the percentage of LEDC industry in 1970? _____

b). What was the percentage of MEDC industry in 2005? _____

c). What percentage of LEDC industry did East Asia account for in 2005? _____

d). What percentage of LEDC industry did South Asia account for in 1990? _____

e). Describe the changes shown in the graph _____

_____

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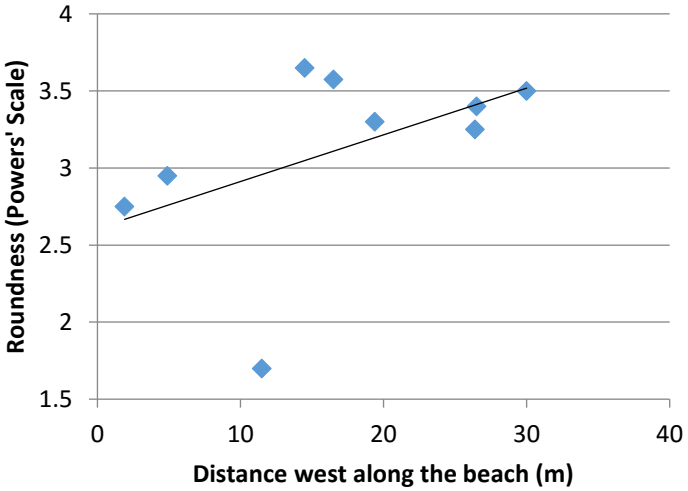
Task 31: Scatter graphs – these have the potential to allow you to investigate the relationship between two sets of data. I have asked the computer to produce a *'line of best fit',* which it has done with a black line. However, is there a result that looks particularly odd? This is called a *'residual' or 'anomaly'* and these are identified as points that lie some distance away from the line.



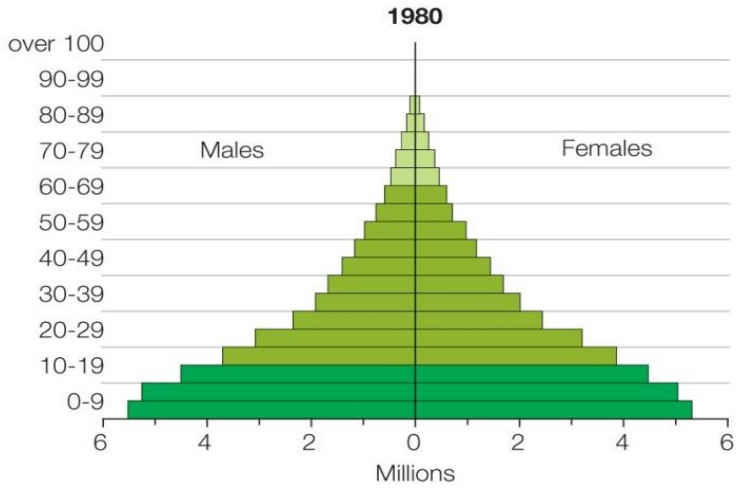
These can be useful as they can give you an idea of a further area for investigation (i.e. go back and sample again).

a). Which point is a residual (circle it) and why do you think it might be there?

b). Pretend the point was not there- draw another line of best fit.

Task 32: Population pyramids

Describe the age structure of this country (i.e. does it have a predominately young population? Do people live a long time etc.?)



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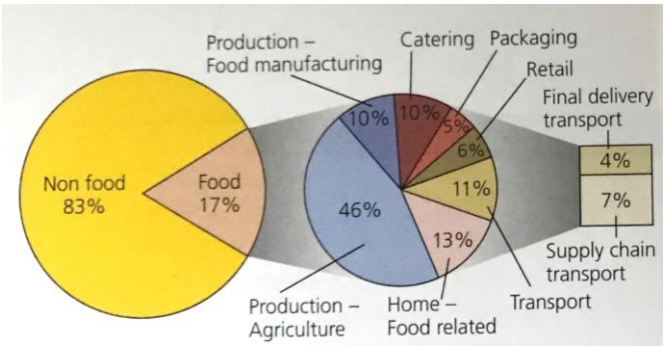
Task 33: Pie charts

Complete the two pie charts based on the data given in the table.

34. Examine the pie chart below, which shows the contribution of food to the UK carbon footprint:



▲ Figure 22.3 The contribution of food to the UK carbon footprint

a). What percentage of the UK's carbon footprint comes from food? _____

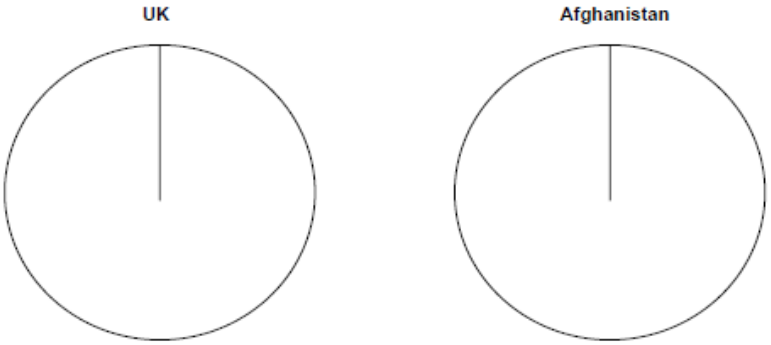
(a) Study **Figure 1** which shows the contrasting age structures of the UK and Afghanistan populations in 2007.

Figure 1

	0-14 years	15-64 years	65 years and over
UK	17.2%	67%	15.8%
Afghanistan	44.6%	53%	2.4%

Complete **Figure 2**, the pie charts for the UK and Afghanistan, using the information in **Figure 1.**

Figure 2



b). What proportion of the UK's 'food' carbon footprint comes from agriculture? _____

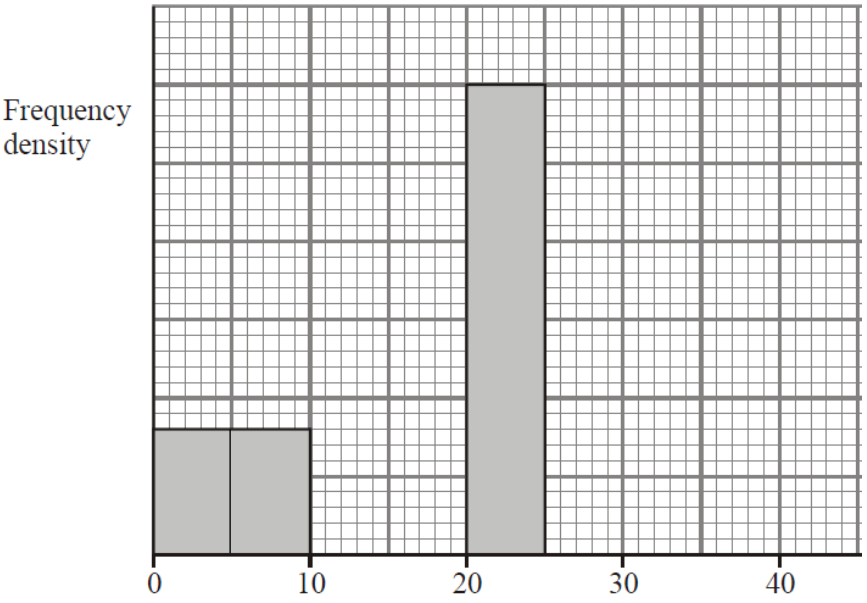
c) Which aspect of 'food' in the UK is responsible for the least proportion of its carbon footprint? _____

Task 35: Histograms

A student conducted a study at East Wittering to see if tourism was important to the economy. One of the questions was, 'How long do you spend in East Wittering?'

The data is shown in the table below. You need to complete the histogram on the right using the data in the table.

Time spent in East Wittering (minutes)	Frequency
0 to 5	4
6 to 10	4
11 to 15	4
16 to 20	6
21-25	15
26-30	15
31-35	14
36-40	10
41-45	5



Describe the trends shown in the histogram _____

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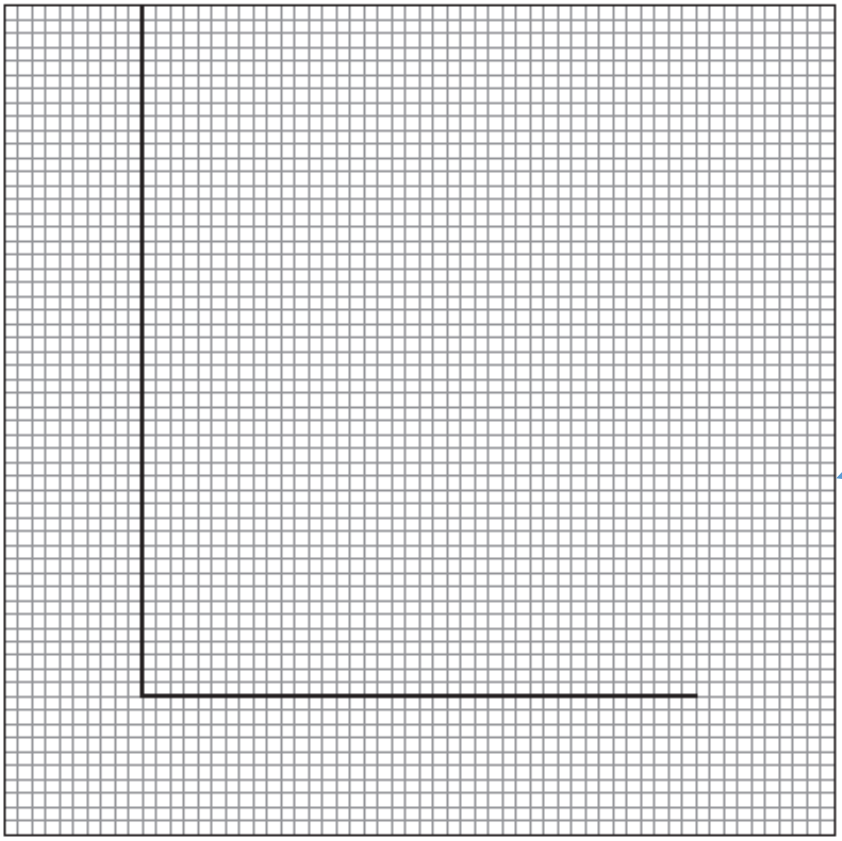
Task 36. Choosing an appropriate graphical technique to display data

Choose an appropriate technique and display the data shown in **Figure 4**, using the axes provided on the graph paper below.



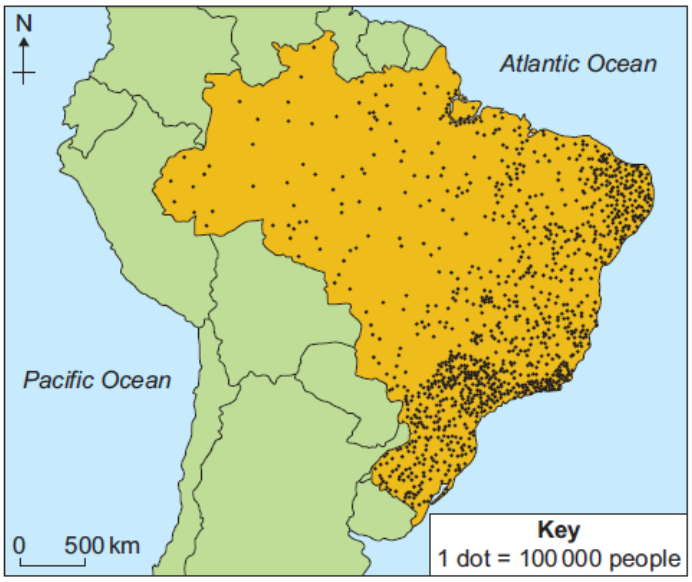
	Birth rate (per 1000 per year)	Death rate (per 1000 per year)
Brazil	17.8	6.4
Russia	11.1	16.0
India	21.0	7.5
China	12.3	7.0

Make sure that you add a title, axis titles and a scale

Part E: Graphical skills – but specifically these are called cartographic skills because you are putting data on to a map/photo etc. directly.

Task 37 – Dot Maps

Examine the map of Brazil on the right. This is where the distribution of a geographical variable is plotted on a map using dots of equal size. Each dot has the same value and is plotted where that variable occurs. The value should be high enough to prevent overcrowding, but too large and some places will not reach the level required to gain a 'dot'! The question and map (right) comes from a real exam paper. Using the map on the right:



a). Describe the population distribution of Brazil

b). Outline one strength and two weaknesses of this method of data presentation

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Task 38 - Desire Lines

These are lines drawn directly from the point of origin to the final destination (unlike the flow line shown above on the A3 where the line actually represents the route taken. You need to produce a desire line map to show the origin of visitors to East Wittering (the red dot) on the map below using the figures in the table.

County	Number
Norfolk	1
Berkshire	3
Kent	5
Wiltshire	6
Staffs	1
Shrops	1
Devon	1
Cornwall	1
Essex	2
Northants	1
West Sussex	20
Hampshire	12

Task 39 - Choropleth shading (note no 'l' after the h)

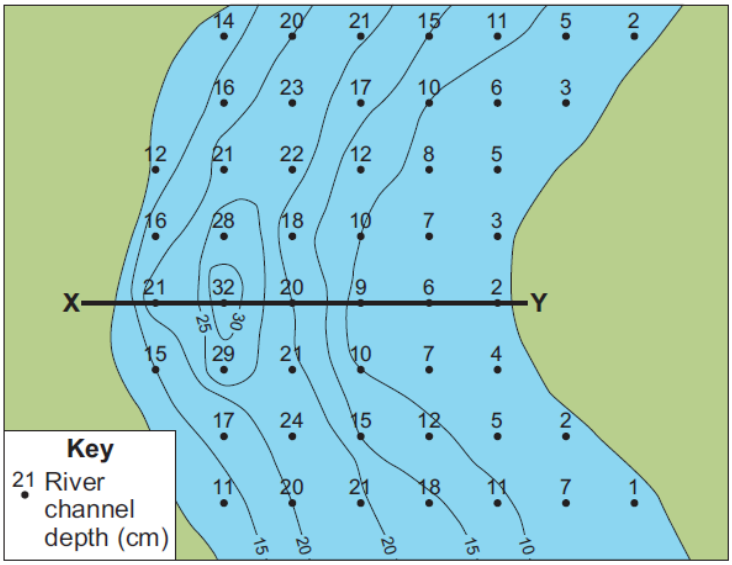
The lines are good, but do not show patterns. Have a go at a choropleth map by shading in the counties of origin to represent the number of people using the same figures as the desire line. I would use 4 categories and complete the table below:

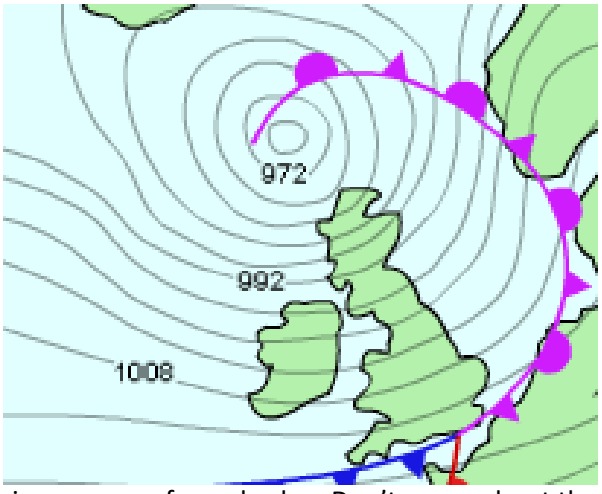
Range	Colour
0-	
>	

N.B. choose the colours wisely- don't just put any old colours down. Perhaps green, yellow, orange red or an increasingly dark shade of one colour. Exam papers may already provide the shading- you must stick to them.

Task 40: Isoline maps

These can be quite hard, but don't panic! The weather map above has used a type of isoline (called isobars). They simply

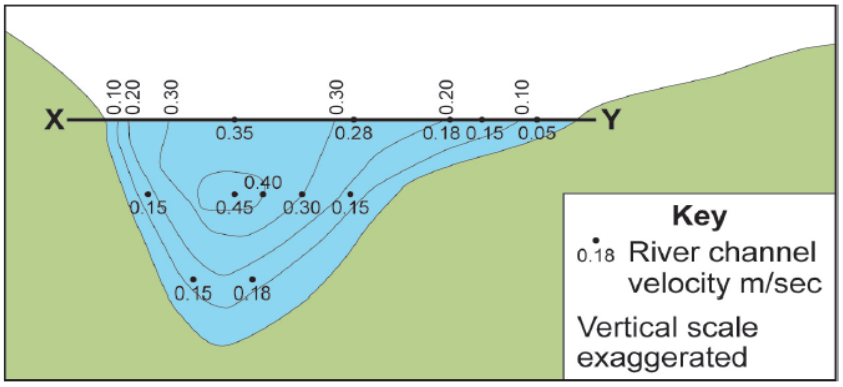




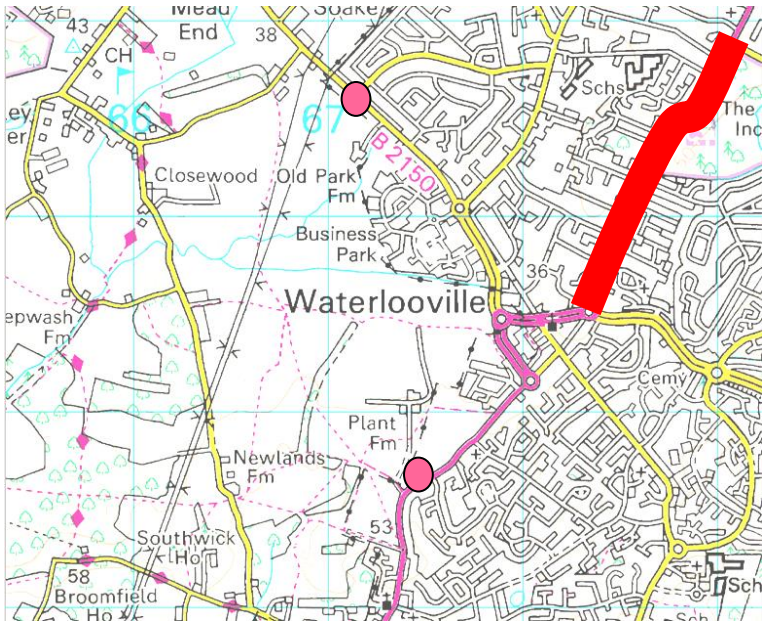
join up areas of equal value. Don't worry about the coloured symbols – these are showing types of weather fronts; you simply need to look at the black lines. In fact, you have already come across something similar earlier in this booklet – contours serve exactly the same purpose.

40a). Have a go at completing the isoline maps from the past exam question above left. The 5 cm isoline is missing. Label it as they have done the other lines.

40b). Identify and label the fastest part of the river on the diagram on the right and Extension – is there a link between the two photos?



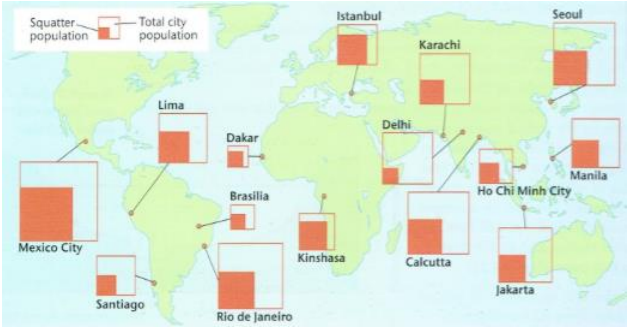
Task 41 - Cartographic skills - flow lines etc.



N.B. The same technique could be applied but in slightly different ways. For example, you could actually draw over the roads to represent the volume of traffic going along it. I have shown this on the A3 going NE towards Cowplain. Equally, you could use proportional circles, squares etc. to show data on maps.

Sometimes a simple pie chart or bar chart doesn't really tell the whole story. It is far better to actually place the data on to a map to provide the spatial dimension. That is what has been started here. A traffic count has taken place on the Denmead Road and also on the A3 (the pink dots). Using the scale for the width of the arrow of 1cm =10 cars add the following on to the graph:

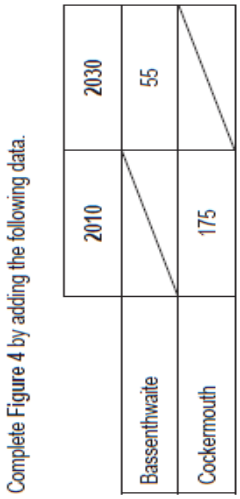
	A3 Going NE	A3 Going SW
Traffic Count	15	20
	Denmead Road Going NW	Denmead Road Going SE
Traffic Count	32	14

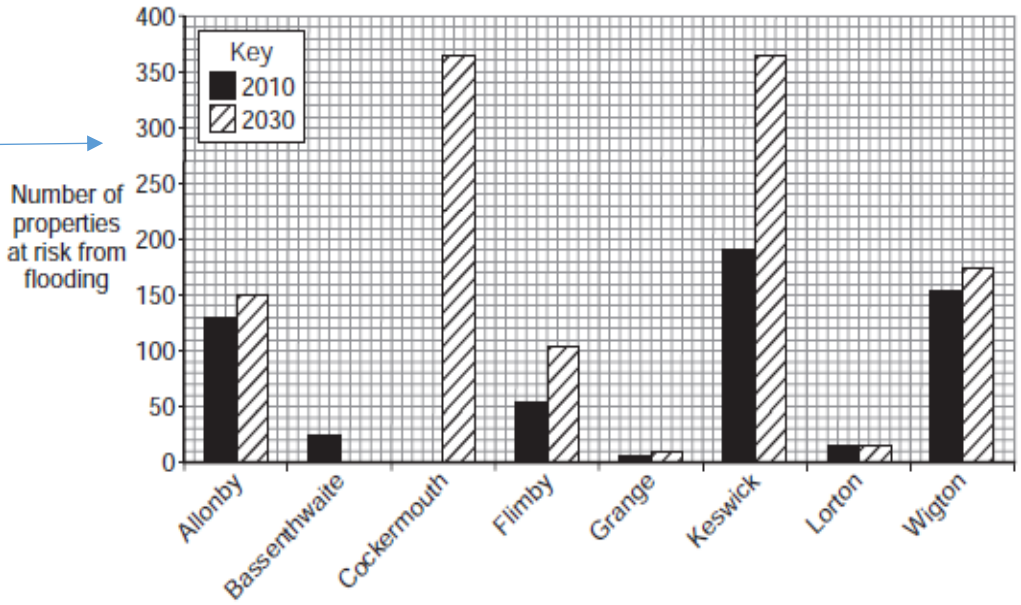


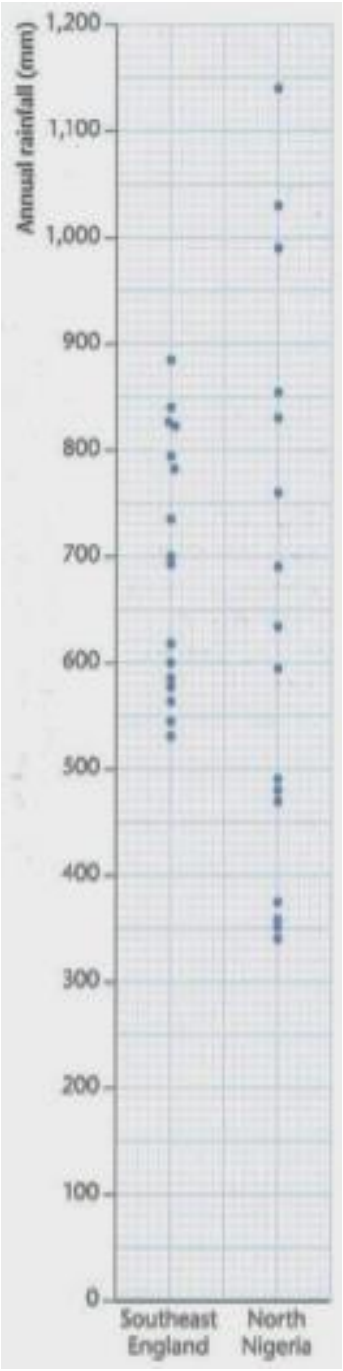
Task 42 – completing graphs that have been started already

Study **Figure 4** which shows the number of properties at risk from flooding in selected settlements in Cumbria in 2010 and 2030.

Figure 4







Task 43: Dispersion diagrams - We will look at these again in the 'statistics' tasks section.

- These are displayed on a vertical scale using dots to represent the values.
- The can show the range of data in a data set
- Dispersion graphs can also show the pattern of distribution of a data set

The example on the left shows the annual rainfall in two different locations over a 16 year period. Therefore, each dot represents the total annual rainfall for a particular year: you should see 16 dots for SE England and 16 for North Nigeria.

43a). What is the range of values (i.e. highest value-lowest value) for:

- SE England = _____
- North Nigeria = _____

43b). What is the highest annual rainfall in the two data sets and where does it come from? _____

43c). What is the lowest annual rainfall in the two data sets and where does it come from?_____

43d). Using your answers to Q20a and other information from the graph, compare the distribution of the data for the two locations. Extension: can you account for these differences? _____

_____

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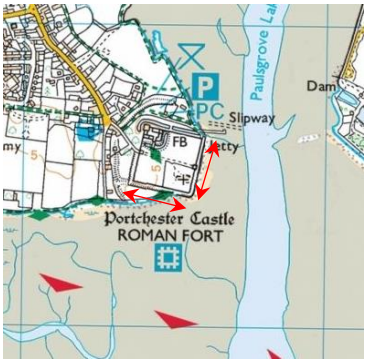
Part F: Numerical skills



1KM

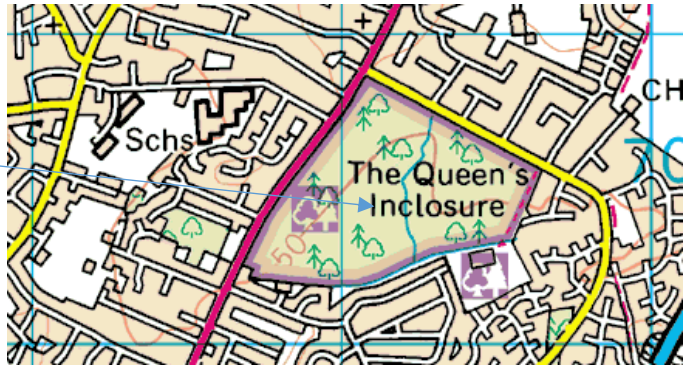
Task 44: Area. You could be asked to calculate the area (space) that something takes up on a map. This can be difficult as things are seldom a uniform shape on a map. An example of an easy shape has been provided on the left from our local area – Portchester Castle. The scale is 4cm = 1km. So, as the castle perimeter walls are roughly square/rectangular, you need to measure the length and height (see red lines on map).

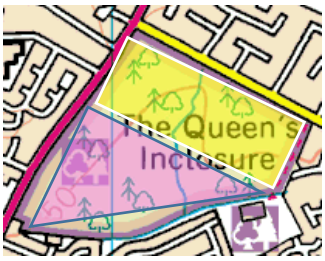
Once you have calculated these, you need to multiply them together to get the area. However, this figure is in centimetres – you need to convert it to km. To do this divide your result by 4 (remember that 4cm = 1km?!). Write your answer below (km^2):

_____

Task 45: Calculating area when there are irregular shapes

Look at the Queens' Inclosure on the right

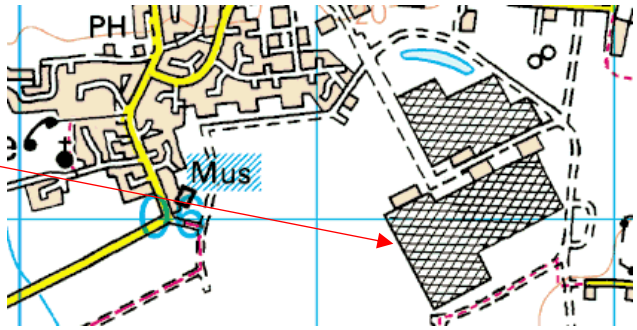




If you were trying to calculate the area of this it would be very difficult as it is not a square/ rectangle. Therefore, you can split the area in to various shapes to allow you to calculate the area. If you look on the left, can you see that I have split the area into a rectangle (width x height) and a triangle (base/2 x height). Using the map above right, can you estimate the area of the Queen's Incloure? Don't forget to divide your final figure by 4 as the scale is 4cm = 1km!!). Show your workings in the space below:

Final answer: _____

Task 46: As above, but this time calculate the area of this greenhouse near Tangmere (Resources topic: growing peppers – all year seasonal demand? Reduce food miles?)?

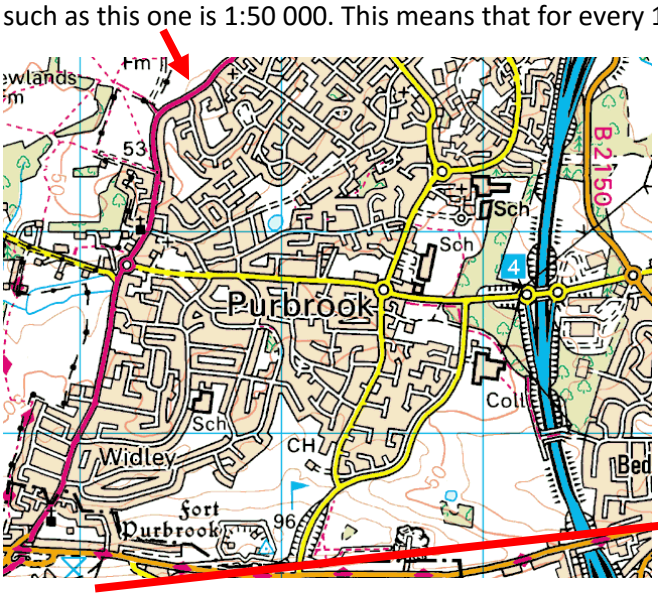


1KM

Final answer: _____

Task 47: Ratios/Scale

Ratios are when you compare two different things. For example, in a class you could have 10 girls and 20 boys. This would give a ratio of 1:2. You are most likely to come across ratios when looking at maps. For example, OS maps such as this one is 1:50 000. This means that for every 1cm on the map, there are 50 000 cm on the ground.



This map looks slightly different and is an OS 1:25 000 map – i.e. 1cm on the map is 25 000 cm on the ground!

Task 48: Ratio (continued) – In the previous task, we found that ratios can be linked to scale in maps.

Country	Population	Number of doctors	Ratio – doctors per 1000
Example - UK	66 500 000	186 200	2.8: 1000
a. Greece	10 750 000	66 650	
b. Italy	60 600 000	236 340	
c. Austria	8 700 000	42 630	

In this instance, we want to find the number of doctors per 1000 of the population. The first country in the table is the UK and I will through this one as an example.

- Step 1: divide the number of doctors by the number of people – 186 200/ 66 500 000 = 0.0028
- Step 2: turn into a ratio per 1000 – multiply the answer by 1000. So, 0.0028 x 1000 = 2.8 doctors per 1000

Use the space below to calculate the number of doctors/1000 for Greece, Italy & Austria. Write your answers here.

Task 49: Proportion

This is relatively easy. If 10% of the population in a country is suffering from undernourishment, then when expressed as a proportion, this would be 1 in 10 are suffering from undernourishment.

49a). There are 25 people in a Geography class. Only 5 can name the capital of Mali (Bamako). What proportion can name the capital of Mali?

_____

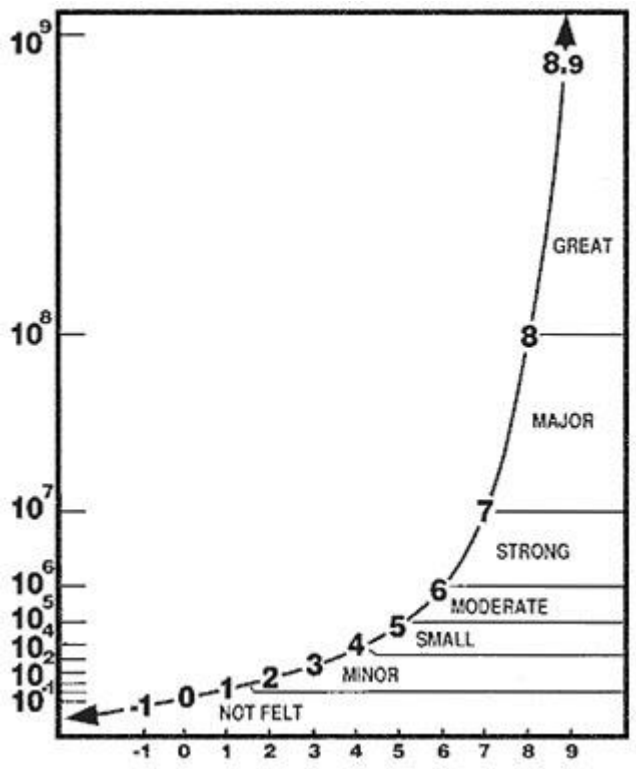
49b). 20% of people in the Geography class can name an actual Arete in the Lake District (can you?!). What proportion of students can do this?

_____

49c). In 1911, there 20% of people worked in primary industries in the UK. What proportion of people working primary industry? _____

Task 50: Magnitude

You are most likely to encounter this when examining earthquakes. Examine the graph on the right. The numbers along the X axis represent the size an earthquake on the Richter scale. The numbers on the Y axis show the amount of shaking. This is a LOGARITHMIC scale, which means that every unit you go up on the scale is 10 x more powerful than the previous.



So, a Richter scale 2 is 10 times more powerful (in terms of shaking) than a 1. A Richter Scale 3 is 100 times more powerful than a 1 (10x10x10).

50a). How much more powerful is a Richter Scale 5 than a 4? _____

50b). How much more powerful is a Richter Scale 6 than a 4? _____

50c). How much more powerful is a 8 than a 5? _____

Task 51: Frequency

This is how often something occurs. You are likely to encounter this when examining earthquakes and volcanic eruptions. If you examine the table below, you will see how many earthquakes of different size classes that you can expect to measure in a year.

Magnitude	Earthquake Effects	Estimated Number Each Year
2.5 or less	Usually not felt, but can be recorded by seismograph.	900,000
2.5 to 5.4	Often felt, but only causes minor damage.	30,000
5.5 to 6.0	Slight damage to buildings and other structures.	500
6.1 to 6.9	May cause a lot of damage in very populated areas.	100
7.0 to 7.9	Major earthquake. Serious damage.	20
8.0 or greater	Great earthquake. Can totally destroy communities near the epicenter.	One every 5 to 10 years

51a). On average you will get a 7-7.9 earthquake in the World, once every _____ days.

51b). What is the relationship between the magnitude of an earthquake and the frequency? _____

_____

_____

_____

_____

Part G: Statistical skills

In Geography, we like to find measures of central tendency. You need to know about:

$$\bar{x} = \frac{\sum x}{n}$$

- Arithmetic Mean
- Mode
- Median

Task 52: Arithmetic mean

To calculate the mean, you need to add up all of the values in the data set and then divide by the numbers of values in that data set - the formula top right shows this

52a). Calculate the mean discharge of this river taken over a 7 year period: 650, 467, 632, 711, 589, 494, 467 = _____

52b). What is the mean population increase for these groups of countries (all per 1000 per year):

23, 11, 34, 26, 31, 8, 31, 24, 9 = _____

Task 53: Mode

This is the most frequent number that occurs in the data set. Using the data sets given in Q22a and Q22b, calculate the mode for each and record in the spaces below. *N.B. when you have a large data set, you can put figures into modal classes, rather than just using every number in a data set.*

53a). Mode of Q52a = _____ 53b). Mode of Q52b = _____

Task 54: Median

$$\frac{n+1}{2}$$

The median is the middle value in a data set when the data has been arranged in rank order. To calculate the median is quite easy. If there is an odd number, the formula on the right can be used. For example, if there are 15 values, the formula would be (15+1)/2 = the 8th number in the sequence. If there is an even number of values in the data set, then the median is the average of the two middle values. For example, look at the following two data sets:

2, 3, 3, 4, 5, 6 = There is an even number of values in this data set, so the median is the average of the middle two values (3+4)/2 = 3.5

7, 9, 10, 14, 16 = There is an odd number of values, so the median is the middle value = 10 (if you wanted to use the formula, (5+1)/2 = 3rd number in the data set, which is 10.

54a). Calculate the median for this data set: 3, 22, 5, 32, 21, 2, 54, 34, 9, 42, 31 (TIP: YOU WILL NEED TO OUT THE NUMBERS INTO RANK ORDER FIRST IN THE SPACE BELOW – Rank order means smallest to largest:

54b). Calculate the median for this data set: 459, 321, 632, 234, 127, 265, 205, 322 (TIP: AGAIN, ARRANGE THE NUMBERS INTO RANK ORDER FIRST BELOW):

Task 55 – mean, median and mode in one task!

This table on the left shows the results from a questionnaire survey, where people were asked how far they had travelled to reach the beach at West Wittering.

Approximate distance travelled to reach West Wittering	Number of people
2 miles	8
5 miles	6
10 miles	4
20 miles	1

55a). Calculate the mean distance travelled. (2 x 8 + 5 x 6 + 10 x 4 etc…) and then divide by how many people were surveyed.

Mean distance travelled: _____

55b). What is the median distanced travelled? Hint – there are 19 people surveyed. I would write the numbers out in rank order and work out the median distance.

Median distance travelled: _____

55c). What is the modal class of distance travelled? _____

Task 56: Measures of dispersion – Range

This is a natural progression from the calculation of the median. If you just take the mean, median and mode of data sets then all the results could be the same, but they do not give an indication of how the data set has been distributed. This is why geographers look at measuring the level of dispersion. Take the smallest number away from the largest number in the data set.

56a). Measure the range of this data set (and write your calculations too): 3, 22, 5, 32, 21, 2, 54, 34, 9, 42, 31, 24

_____

56b). Measure the range of this data set: 459, 321, 632, 234, 127, 265, 205, 322, 284

_____

Task 57: Measures of dispersion - Interquartile range

The measurement of the range in task 56 is quite a crude figure. The measurement of the interquartile range provides a more detailed look at the level of dispersion. It ignores the extremities of data and indicates the spread of the middle 50% of data around the MEDIAN value.

Essentially, interquartile range requires you to rank the data in order and then split the data into 4 equal groups/ quartiles. The boundary between the first and second quartiles is called the 'upper quartile' and the boundary between the third and fourth quartiles is called the 'lower quartile'.

To calculate the upper quartile (UQ) you use the formula top right

$$\frac{(n+1)}{4}$$

To calculate the lower quartile (LQ) you use this formula

$$\frac{3(n+1)}{4}$$

The interquartile range (IQR) is calculated as follows:

IQR = UQ – LQ

Worked Example for this data set: 3, 22, 5, 32, 21, 2, 54, 34, 9, 42, 31,

Step 1 – rank the data set in order (highest to lowest):

54, 42, 34, 32, 31, 22, 21, 9, 5, 3, 2

There are 11 numbers so the median is the 6th value (11+1)/2, which is 22.

Step 2 – calculate Lower Quartile (LQ): 3(11+1)/4 = 9th number in the data set, which is 5

Step 3 – calculate Upper Quartile (UQ): (11+1)/4= 3rd number in the data set, which is 34

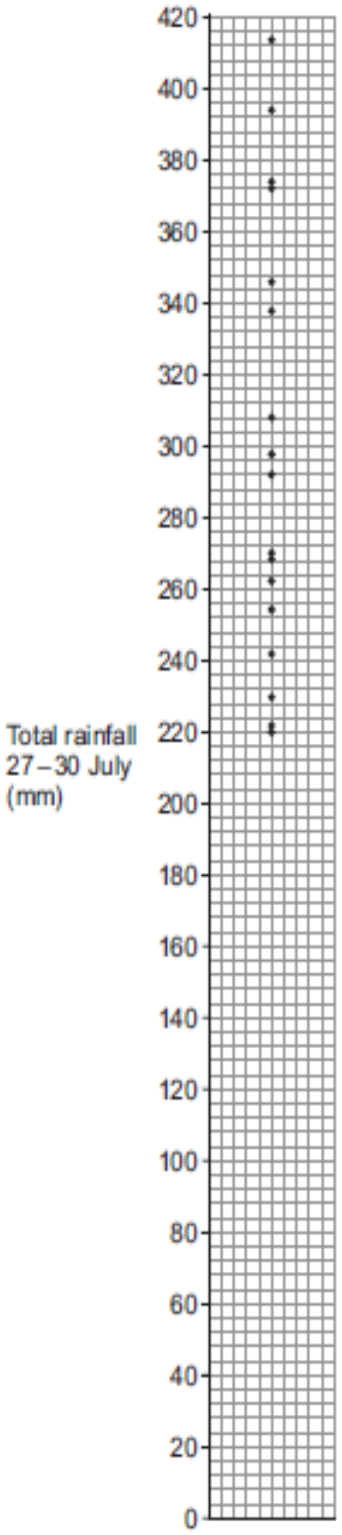
Therefore, the interquartile range (IQR) is 34-5 = **29**

57a). Calculate the IQR for the following data (clearly, rank them in order first highest to lowest, calculate the UQ figure and the LQ figure and then calculate the IQR).

23, 24, 12, 43, 25, 32, 27

57b). As in Q57a – find the IQR of this data set: 4, 3, 1, 15, 13, 2, 16, 12, 18, 21, 5

Remember – take an average of two numbers for UQ and LQ here as there will be not one number for the lower and upper quartile.



Task 58 – Dispersion graphs linked to IQR. Earlier on in this booklet, I introduced you to dispersion diagrams. However, they can be employed with interquartile range. The dispersion diagram on the right shows the amount of rainfall at various weather stations in Pakistan between 27-30 July 2010. 58a). Plot the data in the table below on to the dispersion graph.

59b). With the graph now complete, calculate the following:

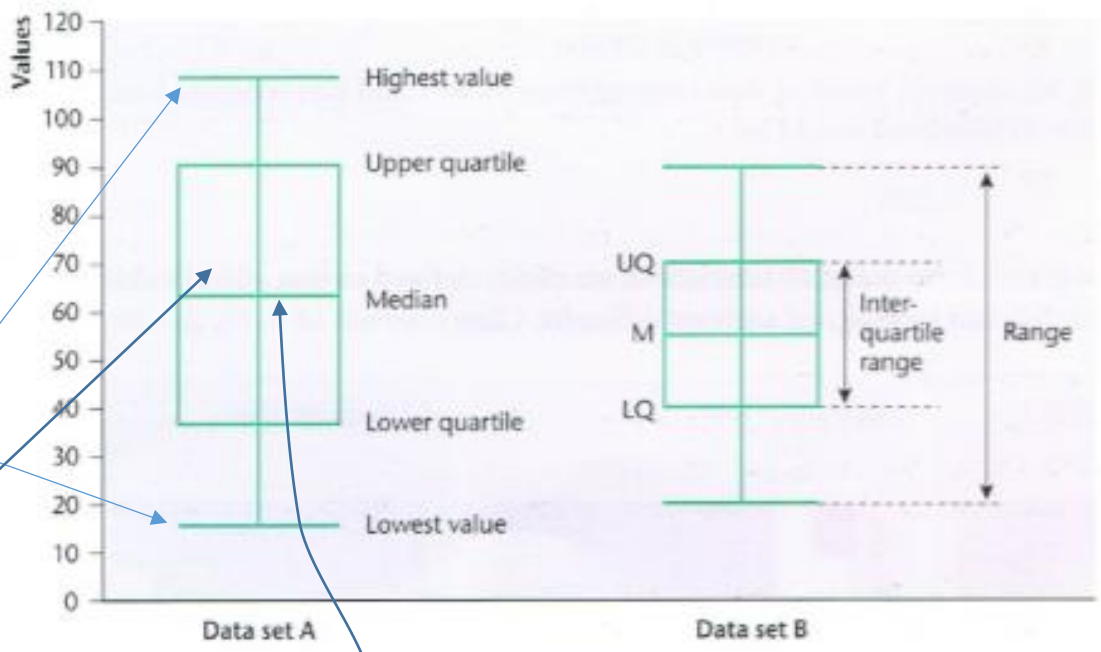
i). Range _____

ii). Median _____

iii). IQR – use the space below

City	Total rainfall 27–30 July 2010 (mm)
Lahore	288
Peshawar	333

Task 59: Interquartile range and display of this information on 'Box-and-whisker plots'.



The IQR can be displayed on a graph like the one shown above. If you look closely, the 'whiskers' represent the highest and lowest value in the data set. The 'box' represents the IQR (the middle 50% of the values) – the central line is the median value.

In the space below, construct a box and whisker plot diagram for the following data sets (I have been nice and put the data sets in order for you already!) Clearly, you need to identify the highest and lowest figures, calculate the median and UQ and LQ. I have left space at the bottom of the sheet to complete your calculations:

Data Set A	Data Set B
1	5
1	5
2	6
3	7
4	8
4	10
5	11
5	11
7	11
9	12
13	12
14	12
14	13
16	13
18	14

Task 60: Percentage increase or decrease in data

This is relatively simple. Take these steps:

- Step 1 – calculate the difference (increase or decrease) between the two numbers you are trying to compare
- Step 2 – Divide the increase by the **original** number
- Step 3 – Multiply the answer by 100 to give a percentage (a negative number means a decrease)

Examine the table below – Afghanistan has been done for you. It shows the % of the population that were undernourished in a 1991 and 2015.

Country	1991	2015	Workings out and final answer
Afghanistan	29.5%	26.8%	**Step 1:** 26.8-29.5= *2.7* (difference) **Step 2:** 2.7/29.5 = *0.092* **Step 3:** 0.092 x 100 = ***9.2% increase***
60a). Ethiopia	74.8%	32%	
60b). Cote D'Ivoire	10.7%	13.3%	
60c). China	23.9%	9.3%	

Task 61: Cumulative frequency (just read this!)

Using cumulative frequencies and quartiles allows Geographers to compare the spread of data. Cumulative frequency is calculated first and is essentially a running total of the data that you have. In task 55a, you had this data table on the right.

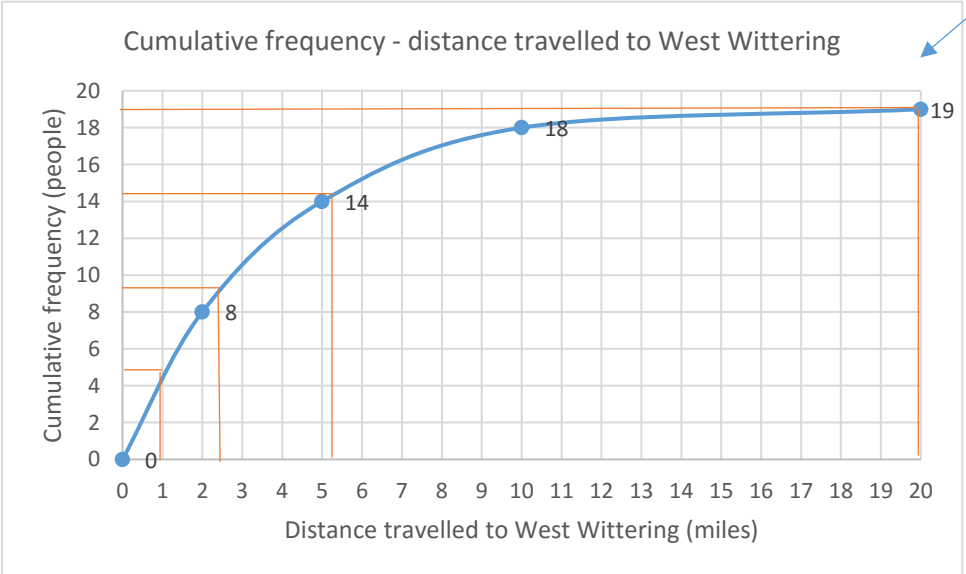
Approximate distance travelled to reach West Wittering	Number of people
2 miles	8
5 miles	6
10 miles	4
20 miles	1

I have added an extra column in the table below to show the cumulative frequency of this data:

Approximate distance travelled to reach West Wittering	Number of people	Cumulative frequency
2 miles	8	8
5 miles	6	14
10 miles	4	18
20 miles	1	19

8
8+6
8+6+4
8+6+4+1

The data in this table can be plotted on to a line graph



I have split the Y axis into 4 equal intervals (19/4 = 4.75)

Where the line from the Y axis intersects with the line graph, you can read down to the x axis and find the upper quartile, lower quartile and median values.

The interquartile range is the difference between the upper and lower quartiles.

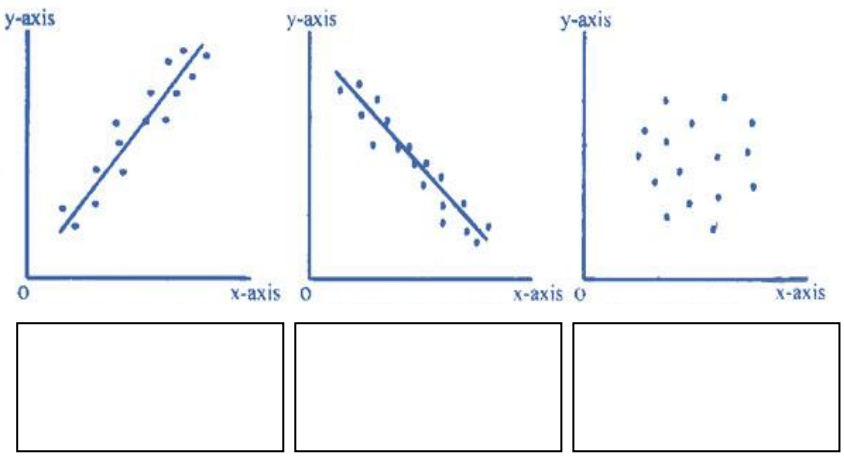
Task 62: Percentiles (again, just read)

A percentile is used to indicate the value below which a given percentage of observations fall. For example, the 90th percentile is the value in a data set below which 90% of the observations occur and above which 10% of values occur.

Linking back to previous tasks, the lower quartile is the 25th percentile and the upper quartile is the 75th percentile. The median value is located at the 50th percentile.

Task 63: Relationships between Bivariate data

Bivariate data means data for two variables that may be considered to be related. For example, GDP and % of people undernourished in a country. In this instance, GDP should influence % undernourished (more GDP = less undernourished). You can plot data such as this on scatter graphs. Look at the scatter graphs on the right under them write 'NO', 'POSITIVE' or 'NEGATIVE' depending on which type of correlation you think they exhibit.



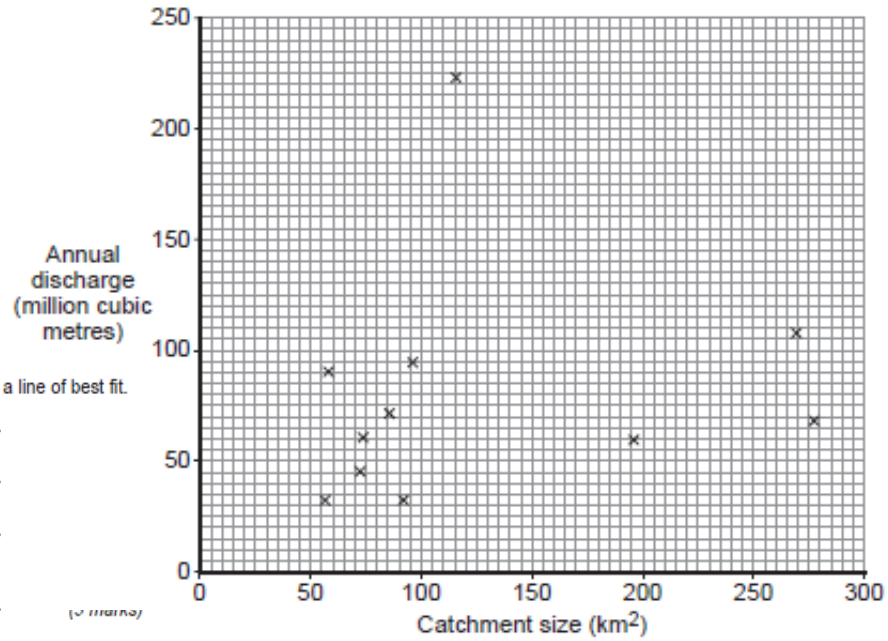
Task 64: Best fit lines on bivariate data/scatter graphs

As discussed above (and in task 31), you can plot bivariate data on a scatter graph. In this question, you need to plot 2 more data points ('x') on the scatter graph.

You then need to draw a line of best fit (equal numbers of points above and below the lines; try and get the line to go through points if possible.

Study **Figure 2** which shows the relationship between catchment size and annual discharge for selected rivers in the north of England in 2009.

Figure 2



Complete **Figure 2** by adding the following data and then drawing a line of best fit.

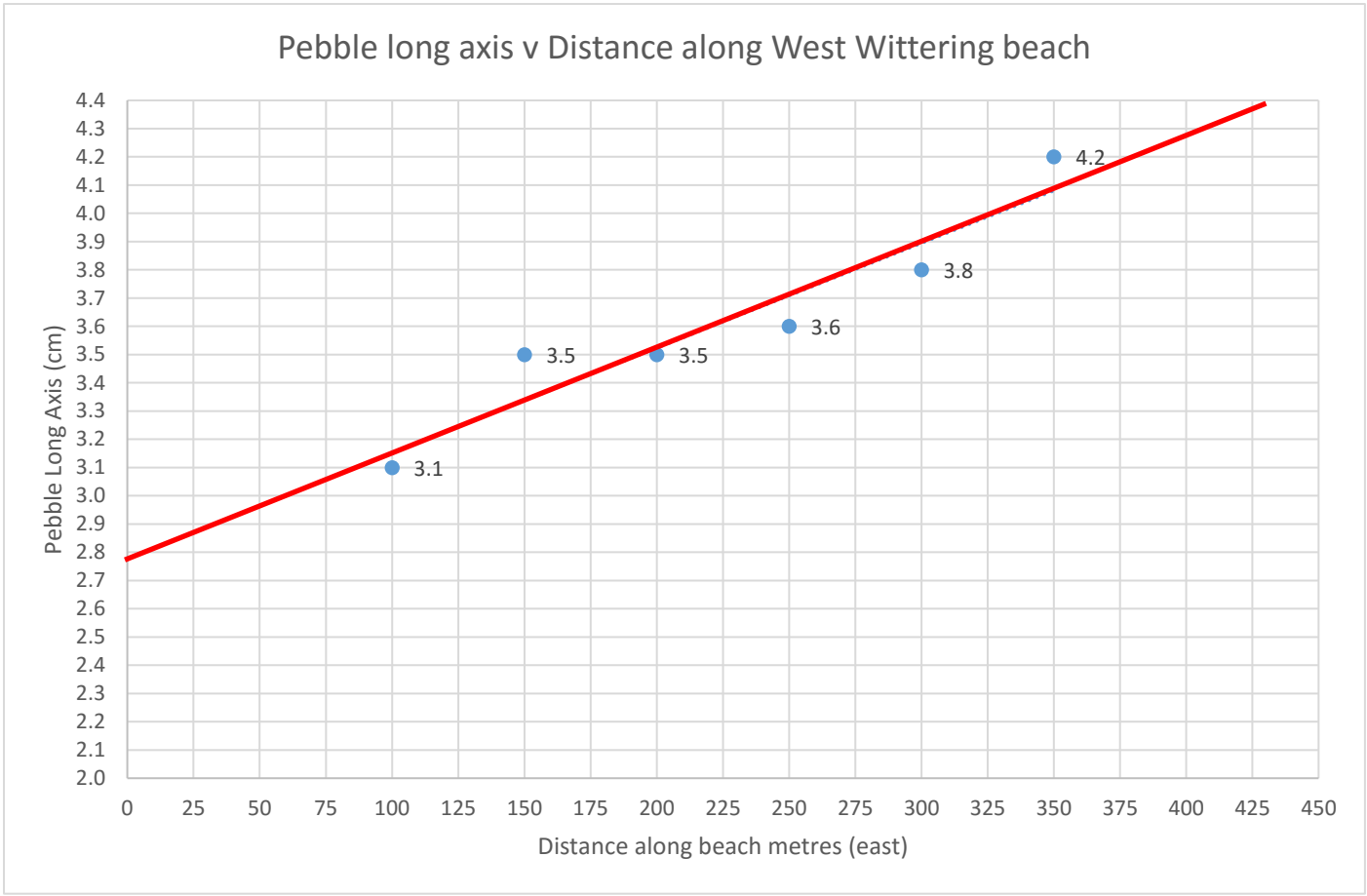
	River X	River Y
Catchment size (km^2)	74	163
Annual discharge (million cubic metres)	32	45

Task 65: Interpolate and Extrapolate data

This is when you estimate an unknown value. You use a line of best fit for this purpose:

- Extrapolation is when you estimate an unknown value that is OUTSIDE the data set
- Interpolation is when you estimate an unknown value that is WITHIN the data set

Examine the graph on the following page for the questions on this.



Interpolate (i.e. the missing value is within the existing data set) the following:

65a). How large are the pebbles likely to be 275 metres along the beach? _____

65b). How large are the pebbles likely to be 170 metres along the beach? _____

65c). How large are the pebbles likely to be 120 metres along the beach? _____

65d). How far along the beach are you likely to be to find a stone that is 3.33 cm long? _____

65e). How far along the beach are you likely to be to find a stone that is 3.8 cm long? _____

Extrapolate (i.e. the missing value is outside the existing data set – the trend line is being used as a predictive tool) the following:

65f). How large are the pebbles likely to be 30 metres along the beach? _____

65g). How large are the pebbles likely to be 405 metres along the beach? _____

65h). How far along the beach are you likely to be to find a stone that is 2.9 cm long? _____

65i). How far along the beach are you likely to be to find a stone that is 4.3 cm long? _____

A word of caution about all of the statistics bits that you have done. Beware of small data sets! Scatter graphs with just 3 or 4 points will not be enough to draw lines of best fit, and therefore to assess levels of correlation.

GOOD LUCK – I THINK I HAVE GONE THROUGH ALL OF THE SKILLS THAT THE EXAM BOARD WANT YOU TO KNOW. IF YOU NEED ANY FURTHER HELP, SEE YOUR GEOGRAPHY TEACHERS!

Mr. Bamford.