

4 A supermarket uses plastic carrier bags.



The handles of some of a **new** set of bags break when customers carry their shopping away.

The supermarket complains to the company that makes the bags.

The company tests 5 of the new set of bags.

They find the mass that will break each bag.

Here are their measurements.

Bag number	1	2	3	4	5
Mass to break handle in kg	6.5	8.2	6.1	10.2	9.0

(a) (i) Use **all** their measurements to find the mean value of the mass to break the handles.

Show your working.

..... kg [2]

(ii) What is the range of these measurements?

..... to kg [1]

(iii) Measurements on older bags have the same mean value.

The range for the older bags is 7.4 to 8.6 kg.

Use this information and your answer to part (ii) to suggest why some of the new bags are breaking more easily than the old ones.

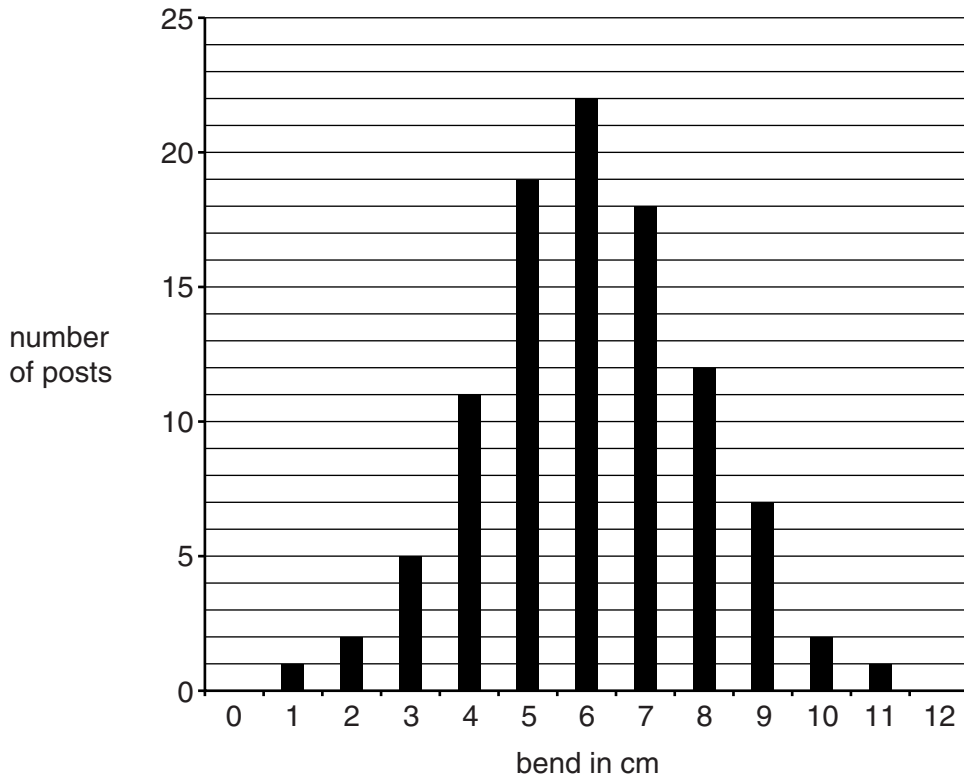
.....
 [1]

4 A company decides to make fence posts from a plastic.

The company makes and tests 100 fence posts with the same size and shape.

They measure how far each post bends under the same conditions.

The bar chart shows their results.



(a) (i) In the test, how many posts bent 9 cm or more?

..... [1]

(ii) The company wants to make 500 posts each day.

They will not sell posts that bend 9 cm or more.

How many posts will they reject each day?

Show your working.

number of posts rejected = [2]

3 A company plans to make a new rope for sailing boats.

The new rope must be strong and quite stretchy.

Scientists working for the company test ropes made from five polymers, **A**, **B**, **C**, **D** and **E**.

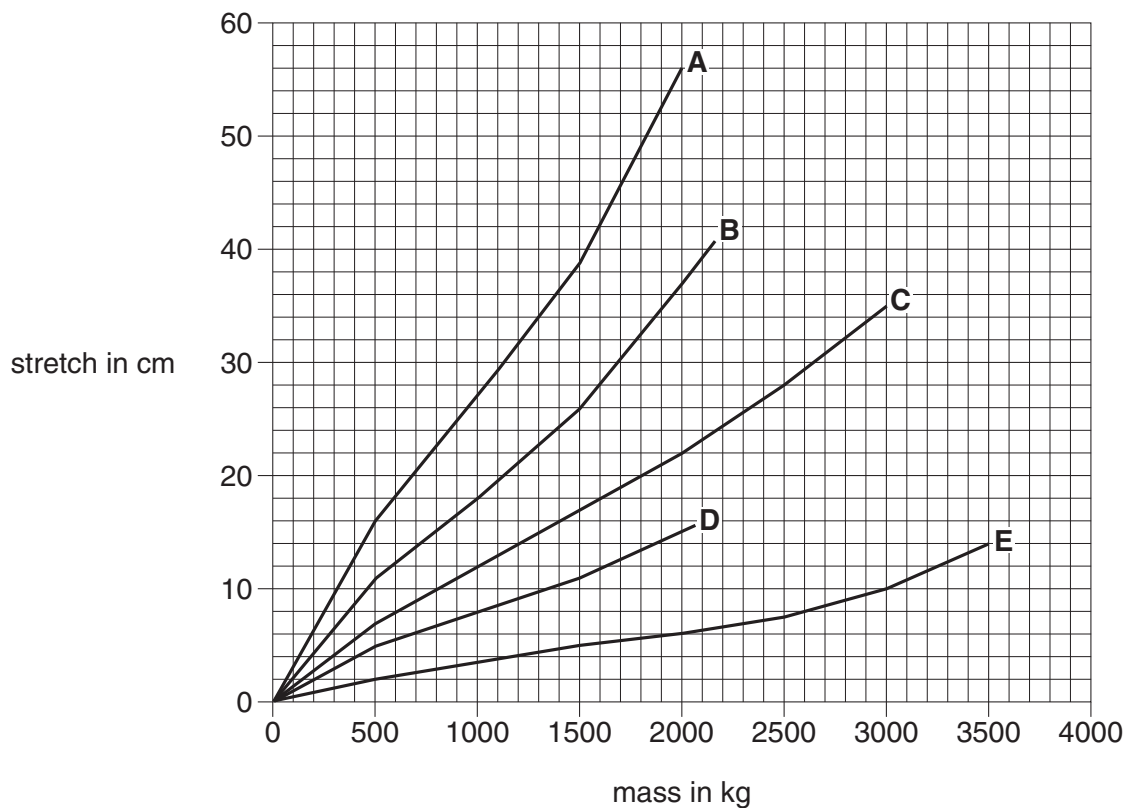
They want to know which is the best polymer to use.

They measure how much each rope stretches as a load is applied to it.

They do this until the rope breaks.

Each rope has the same thickness and the same length.

Their results are shown in the graph. Each line ends when the rope breaks.



(a) Each rope must have the same thickness and length to make it a fair test.

Explain why.

.....

.....

.....

..... [2]

(b) Use the graph to decide which of these statements are **true** and which are **false**.

Put ticks (✓) in the correct boxes to show your choices.

	True (✓)	False (✓)
None of the polymers stretch.		
The polymer that supports the biggest mass breaks at 3000 kg.		
All of the polymers can support a mass of 1500 kg.		
The polymer that supports the biggest mass stretches the least for a mass of 1500 kg.		

[2]

(c) (i) All five lines on the graph show the same pattern.

Finish this sentence to describe the pattern.

As the mass , the polymer stretches [1]

(ii) The graph shows differences between the polymers.

Give **two** differences.

1

2

[2]

(d) The company chooses to make the new rope from polymer **C**.

Suggest why they use this polymer rather than any of the others.

.....

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.....

.....

..... [3]

[Total: 10]