8 (a) Write $y = x^2 - 8x - 3$ in the form $y = (x - a)^2 + b$.

(a) ..... [2]

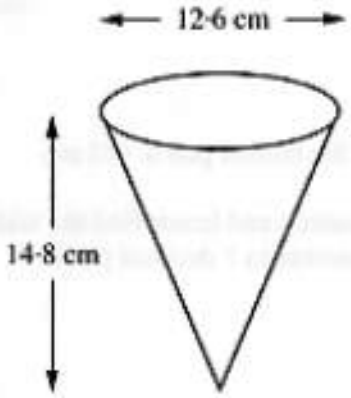
(b) Hence state the coordinates of the minimum point on the graph of $y = x^2 - 8x - 3$.

(b) (..... , ...) [1]

3

9 This cone is designed to hold chips.

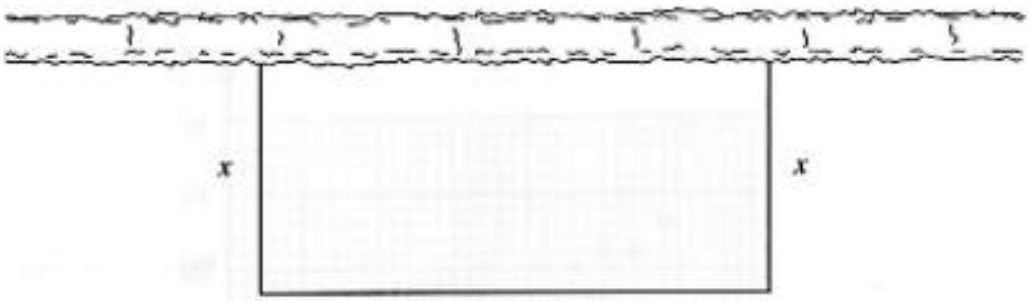
Calculate the curved surface area of this cone.



.....cm^2 [4]

4

10 Farmer George constructed a rectangular animal pen against an existing hedge.
He used 80 m of wire netting.



(a) The width of the animal pen is x metres.

Write down an expression for the area of the animal pen.

(a) .....m^2 [1]

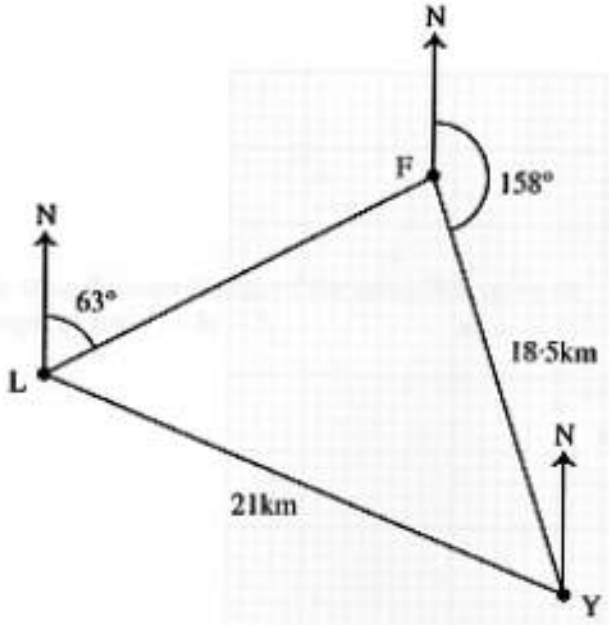
(b) The area of the animal pen is 482 m^2.

Form an equation and hence find the width of the animal pen.
Give your answer to 1 decimal place.

(b) .....m [4]

5

11 The bearing of a ferry (F) from a lighthouse (L) is 063°.
The bearing of a yacht (Y) from the ferry is 158°.
The yacht is 18·5 km from the ferry and 21 km from the lighthouse.



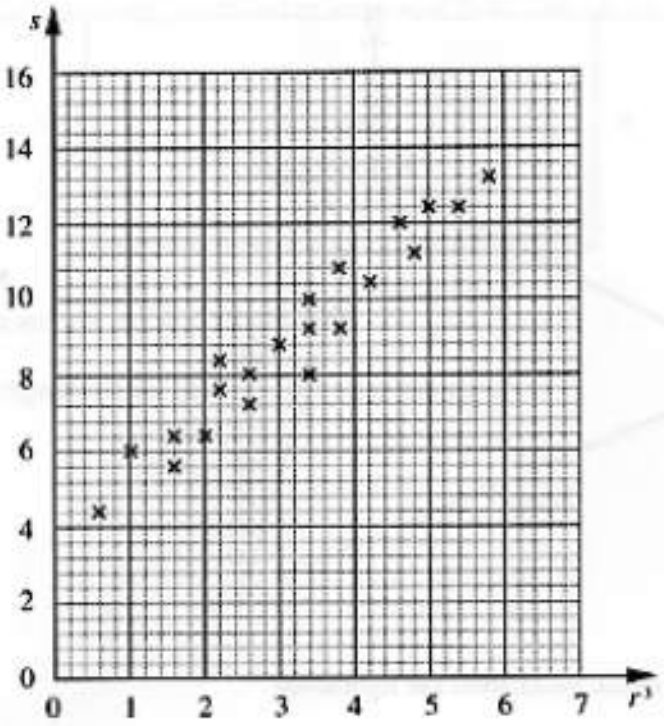
Not to scale

Calculate the bearing of the yacht from the lighthouse.

..... ° [3]

3

12 In an experiment, the values of s and r are recorded.
It is believed that s and r are connected by an equation of the form $s = ar^3 + b$.
The values of s against r^3 are plotted on the graph.



Find approximate values for a and b.

a = ...

b = ...[3]

[3]

13 The school governors considered changing the start of the school day from 9 am to 8:15 am. They decided to ask the opinion of a representative sample of the students in the school.

This table shows the number of students in each year group of the school.

Year Group	Number of students
7	153
8	161
9	157
10	123
11	96

(a) Comment on the following idea for obtaining a random sample of students.

Ask every 10th student as they arrive one morning.

.....

.....

.....

.....[1]

(b) Suggest a method for obtaining a representative sample of 100 students.

Explain how this could be done.

.....

.....

.....

.....[2]

3

TURN OVER FOR QUESTION 14