Question 24 (7 marks)

A researcher conducted a field experiment to determine the effects of planting density on the yield of cauliflowers.
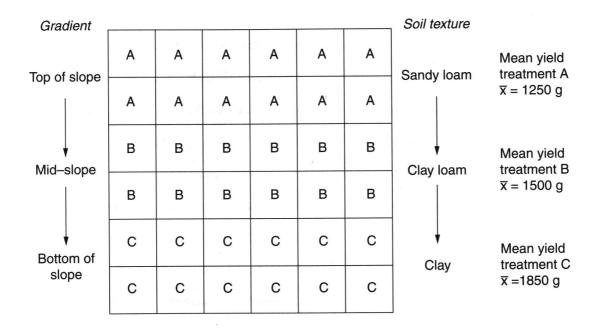
Three planting densities were used:

Treatment A – 20 cm spacing between plants

Treatment B – 50 cm spacing between plants

Treatment C – 80 cm spacing between plants

The researcher prepared 36 trial plots of equal size. Mean yields (grams/cauliflower) for each of the treatments and the position of each plot are shown. The soil texture trend and gradient of the field are also shown.

Gradient							Soil texture	
	A	A	A	A	A	A		Mean yield treatment A $\overline{x} = 1250$ g
Top of slope	A	A	A	A	A	A	Sandy loam	
	B	B	B	B	B	B		Mean yield treatment B $\overline{x} = 1500$ g
Mid–slope	B	B	B	B	B	B	Clay loam	
	C	C	C	C	C	C		Mean yield treatment C $\overline{x} = 1850$ g
Bottom of slope	C	C	C	C	C	C	Clay	

(a) Which treatment in this experiment is most likely to produce the greatest number of cauliflowers?   **1**

..............*Treatment B*..

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Question 24 (continued)

(b)   Construct a graph that represents the mean yields of the THREE treatments in   **3**
       this experiment.

Mean Yields of cauliflower

(c)   Explain how an alternative experimental design for this experiment may   **3**
       improve the validity of the results.

If the researcher spread out the
amount of treatment or made more
experiments with greater differences, then
the researcher will have had more of
a validity of the final results

End of Question 24