

- 7 The entrance fee for a museum is 8 dollars.
One day the number of visitors to the museum was 250

(a) Calculate the total entrance fees paid for this day.

(1)

The entrance fee is increased from 8 dollars by 20%

The day after this increase the number of visitors to the museum decreased from 250 by 10%

(b) Calculate the total entrance fees paid on the day after the price increase.

(3)

The museum estimates that the number of visitors in a day will decrease from 250 by $r\%$ when the entrance fee is increased from 8 dollars by $(2r)\%$

After the entrance fee is increased from 8 dollars by $(2r)\%$, the total entrance fees paid in a day is T dollars.

(c) Using the museum's estimate, show that

$$T = 2000 + 20r - 0.4r^2$$

(4)

(d) Find the value of r for which T is a maximum.
Show clear algebraic working.

(3)

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Question 7 continued

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(Total for Question 7 is 11 marks)

