Marked example 3

Paper 2 style · Graphic display calculator

3 6 marks SL 2.6 · 2.7 ●●○ Typical

A company makes x hundred phone cases a week. Its weekly profit, in thousands of euros, is modelled by $P(x) = -2x^2 + 60x - 250$.

(a) Find the number of phone cases that gives the greatest profit, and that greatest profit. **[3]**

(b) Find the values of x for which the profit is more than 100 thousand euros. **[3]**

MARKSCHEME (a)

vertex at $x = -\dfrac{60}{2(-2)} = 15$ **(M1)**

1500 cases **A1**

$P(15) = 200$: 200 000 euros **A1**

Total 3 marks

MARKSCHEME (b)

$-2x^2 + 60x - 250 = 100$ **(M1)**

$x = 7.93$ or $x = 22.1$ $(7.92893\ldots, 22.0710\ldots)$ **(A1)**

$7.93 < x < 22.1$ **A1**

Total 3 marks

Note Between about 793 and 2207 cases a week.

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