Exercise 3

Paper 2 style · Graphic display calculator

3 7 marks SL 4.4 · 4.10 ●●○ Typical

The age x years of eight cars of the same model and their value y thousand euros are shown.

x	1	2	4	5	7	8	10	11
y	30	25	27	21	22	15	17	12

(a) Find the value of Pearson's correlation coefficient r. **[1]**

(b) Find the equation of the regression line of y on x. **[2]**

(c) Estimate the value of a car aged 9 years. **[2]**

(d) Estimate the age of a car worth 20 thousand euros. **[2]**

The markscheme is on the next page: try the question first. Written and verified by a practising IB mathematics teacher, produced with AI assistance; solved twice and recomputed by software. Not affiliated with or endorsed by the International Baccalaureate Organization.
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MARKSCHEME (a)

$r = -0.925 \ (-0.925380\ldots)$ **A1**

Total 1 mark

MARKSCHEME (b)

$y = -1.58x + 30.6 \ (-1.57608\ldots, 30.5815\ldots)$ **A1A1**

Total 2 marks

Note A1 for each coefficient.

MARKSCHEME (c)

$-1.57608 \times 9 + 30.5815$ **(M1)**

16.4 thousand euros $(16.3967\ldots)$ **A1**

Total 2 marks

MARKSCHEME (d)

line of x on y: $x = -0.543y + 17.5$ **(M1)**

6.61 years $(6.61124\ldots)$ **A1**

Total 2 marks

Note Not the line of (b) rearranged, which gives 6.71.