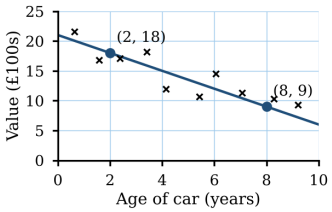
| Day 50 | S Tier 10-a-day |
|---|---|
| **1** Solve $7 \cos x + 1 = 0$ for $0° \leq x \leq 360°$.<br>(Calculator)<br>Give your answers correct to 1 decimal place. | |
| **2** Factorise fully $2x^3 - 32x$ | |
| **3** A 5% increase followed by a 50% decrease is equivalent to a single percentage change.<br>Work out the single percentage change that has the same effect. | |
| **4** OA = $\mathbf{a}$ and OB = $\mathbf{b}$.<br>OP = $-\mathbf{b}$, OQ = $3\mathbf{a} - 10\mathbf{b}$ and OR = $5\mathbf{a} - 16\mathbf{b}$.<br>(a) Show that P, Q and R lie on a straight line.<br>(b) Work out the ratio PQ : QR in its simplest form. | |
| **5** A bag contains marbles.<br>$\frac{1}{4}$ of the marbles are yellow and $\frac{1}{3}$ of the marbles are black.<br>The rest of the marbles, 10 of them, are white.<br>How many yellow marbles are there? | |

**Day 50** **S Tier 10-a-day**

**6** A and B are the points (6, −6) and (12, −16).
AB is a diameter of a circle.
Find an equation of the circle.

**7** A rectangle has area $(-1 + 3\sqrt{5})$ cm$^2$ and length $(3 + 2\sqrt{5})$ cm.
Find the width of the rectangle.
Give your answer in the form $a + b\sqrt{5}$

**8** The scatter graph shows age of car (x) and value (y).
The line of best fit passes through (2, 18) and (8, 9).
(a) Find its equation in the form y = mx + c.
(b) Explain what its gradient tells you.




**9** Show algebraically that the difference between the cubes of any two consecutive integers is always an odd number.

**10** Container A holds juice and water in the ratio 1 : 5.
Container B holds juice and water in the ratio 1 : 1.
18 litres from container A is mixed with some of container B.
The ratio of juice to water in the mixture is 3 : 7.
Work out how many litres were taken from container B.