Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

amplitude **3**; $\mathbf{y = 5}$

2.2

period $\frac{360}{45} = \mathbf{8}$; max **14**; min **6**

2.3

graph for $0 < x < 7.5$; $x = 2.83$; $V = \mathbf{379}$ cm^3

3.1

(a) $c = \mathbf{6}$; $a = \mathbf{3}$; period 12, $b = \mathbf{30}$

(b) $6 + 3\sin 150^\circ = \mathbf{7.5}$ m

(c) $3\sin(30t) + 6 = 7$; $t = 0.649$ and 5.351; $\mathbf{4.70}$ hours

3.2

(a) \$**15**; $15 + 4 \times 3 =$ \$**27**

(b) $15 + 4(x - 5) = 35$; $x = \mathbf{10}$ GB

(c) cubic regression; $\mathbf{y = x^3 - 5x^2 + 9x - 3}$

(d) **42**; $x = 5$ is outside the data, and a cubic through four points fits them exactly, so the prediction may be poor (R1)

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