# M1.1 – Use an appropriate number of significant figures

## Teacher answers

### Quiz

1. In each case convert to the number of significant figures quoted.

2340

a) 2342 to 3 sig fig

2300

b) 2342 to 2 sig fig

460

c) 456 to 2 sig fig

0.0784

d) 0.07842 to 3 sig fig

0.078

e) 0.07842 to 2 sig fig

0.00300

f) 0.003004 to 3 sig fig

(Note: for questions 2 to 4 you should be able to identify the appropriate number of significant figures to which to give your answer as well as convert the calculated result to that number of sig figs. If you are finding the calculations themselves difficult please refer to M2.3 and M2.4).

2. A hypothermic patient was rewarmed from 30.6°C to 37.1°C over the course of 3.4 h. What was the rate of warming (use °C h-1 as your units)?

Lowest number of sig figs in the data = appropriate number of sig figs in final answer = 2

Change in temperature (final temp – initial temp) = 37.1 – 30.6 = 6.5°C

Rate of warming = change in temp / time taken = 6.5 / 3.4 = 1.911747 = 1.9°C h-1 (to 2 s.f.)

3. A willow coppice woodland in the UK has an area of 1.15 ha. (ha is the symbol for heactare – an area of land equal to 10,000 m2). When the willow harvest is taken each year, and dried, it yields 9 odt (oven-dry tonnes) of biomass. What is the productivity of the land (the amount of biomass produced per unit area) in units of odt ha-1?

Lowest number of sig figs = appropriate number of sig figs in final answer = 1

Productivity = biomass / area = 9 / 1.15 = 7.82609 = 8 odt ha-1 (to 1 s.f.)

4. A model cell is made of visking tubing (partially permeable membrane) containing sucrose solution and is immersed in distilled water. In 23.5 min the volume of the model cell increases by 1.0 cm3 due to inflow of water by osmosis. What is the rate of osmosis in units of cm3 min-1?

Lowest number of sig figs = appropriate number of sig figs in final answer = 2

Rate of osmosis = 1.0 / 23.5 = 0.0425532 = 0.043 cm3 min-1 (to 2 s.f.)

Or, in standard form, 4.3 x 10 -2 cm3 min-1 (to 2 s.f.)

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