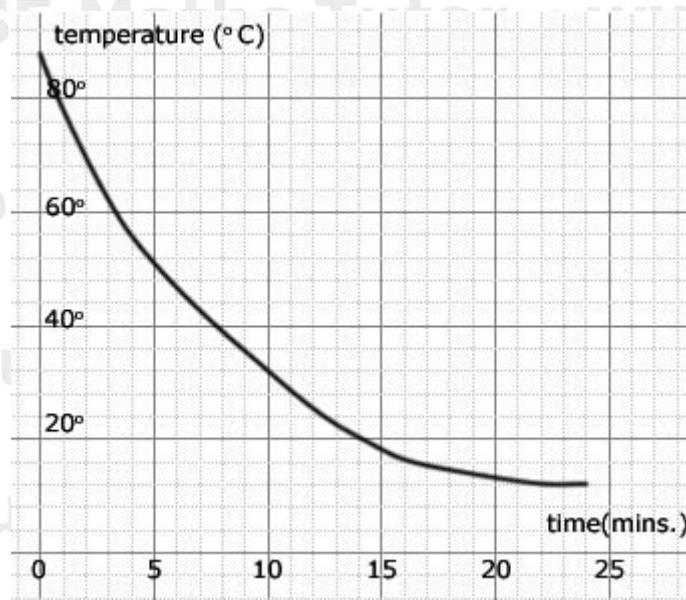


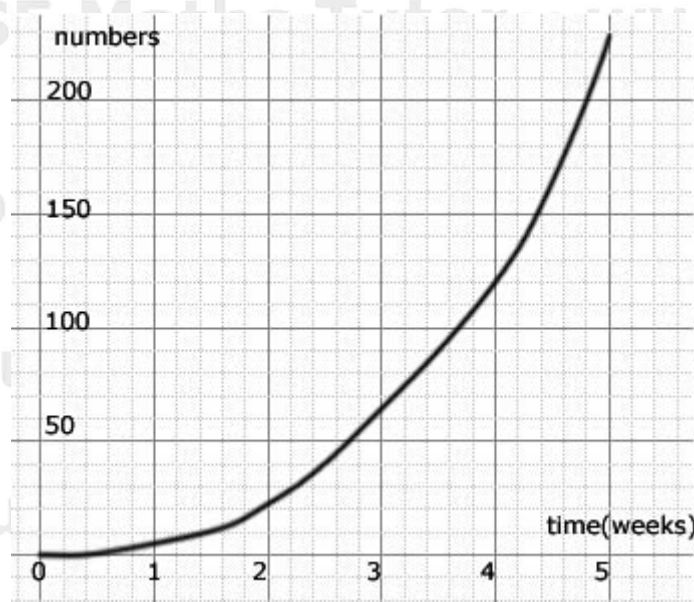
1. The graph is from an experiment studying the cooling of water.



$$\text{heat loss(joules)} = 4200 \times [\text{mass of water - kg}] \times [\text{temperature drop - } ^\circ \text{C}]$$

- What is the starting temperature of the water?
- What is the final temperature of the water?
- How long does it take for the water to reach the final temperature?
- What is the temperature drop of the water in the first 10 minutes?
- What is the total temperature drop over the period of the experiment?
- What is the average temperature drop per second over the first 15 minutes. (2 d.p.)
- What is the average temperature drop per second over the period of the experiment. (2 d.p.)
- If the mass of the water is 500g, how much heat energy is lost in cooling down from 32° C to 12° C ?
- If the mass of the water is 2kg, how much heat energy is lost in cooling down in the first 10 minutes?
- How much energy would be lost by 100g water in cooling down over the period of the experiment? (2 .d.p.)

2. The graph is a survey of weed numbers in one hectare of rough grassed area over time.



$$\text{mass of weeds(g)} = 17.5 \times (\text{number of weeds})$$

- How many weeds were there after 4 weeks?
- How many days did it take for the weed numbers to reach 100?(nearest whole day)
- How many weeds grew between the 4th and 5th week?
- How many days did it take for the weed numbers to reach 200? (nearest whole day)
- What is the mass of weeds in kilograms at the end of 5 weeks? (2 d.p.)
- If one hectare measures 100 x 100 metres, how many weeds are there per square metre after 4 weeks? (3 d.p.)
- What mass of weeds(kg) would you expect in a grassed area measuring 1kilometre square after 21 days?

- 1.
- (a) 88°C
 - (b) 12°C
 - (c) 24 mins.
 - (d) 56°C
 - (e) 76°C
 - (f) $0.08^{\circ}\text{C/sec.}$
 - (g) $0.05^{\circ}\text{C/sec.}$
 - (h) 42,000 joules
 - (i) 470,400 joules
 - (j) 31,920 joules

- 2.
- (a) 120
 - (b) 26 days
 - (c) 110
 - (d) 34 days
 - (e) 4.03 kg
 - (f) 0.012
 - (g) 113.75 kg