Exercise 1 Calc. : ✓

A group of scientists decides to investigate a population of insects in a large field. It is found that the starting population 100 and that the population increases exponentially by 20% every week. Two students each write down a formula to model the population P at a time t, where t is the number of days since the start of the investigation:
Formula A: $P(t) = 100t + 1.2$
Formula B: $P(t) = 100 \cdot (1.2)^t$

1. Explain why formula B is the correct formula and why formula A is incorrect. — 2 marks
2. Calculate the number of insects after 2 weeks, to the nearest whole number. — 2 marks
3. Copy and complete the table of values below, giving your answers to the nearest whole number: — 2 marks

Number of days	**5**	**10**	**15**	**20**
Population				

4. After how many days will the population exceed 4 600? — 2 marks

Another group of scientists investigates a population of insects in a different large field. They record their results in the table below:

Number of days	**0**	**5**	**10**	**15**	**20**
Population	**100**	**340**	**580**	**820**	**1 060**

5. Explain why the results follow a **linear** model. — 1 mark
6. Use the information in the table of values to write down a formula to model the population P at a time t, where t is the number of days since the start of the investigation. — 2 marks