

Exercise 1

Calc. : ✓

In New Portland there are only two car manufacturers, Homba and Tayita. 58% of the cars are produced by Homba and the rest is produced by Tayita. No cars by other manufacturers exist. 7% of the cars produced by Homba do not meet the rigorous emission standards set by New Portland's environmental agency, whereas 87% of the cars produced by Tayita do meet these standards.

1. Draw a tree diagram illustrating this situation. All notation must be defined and all branches of the tree must be clearly labelled. 5 marks
2. What is the probability that a car meets the emission standards given that it was produced by Homba? 2 marks
3. What is the probability that a car was produced by Tayita **and** meets the emission standards? 2 marks
4. If a car is selected at random, what is the probability that it meets the emission standards? 3 marks
5. Given that a car meets the emission standards, what is the probability it was produced by Tayita? 3 marks

A study shows that the probability of a car meeting the emission standards is equal to 90%
Ten cars are randomly selected.

6. Write the formula that allows you to calculate the probability that k cars out of the ten chosen meet the emission standards. **The use of the formula must be carefully justified.** 4 marks
7. What is the probability that all cars chosen will meet the emission standards? 2 marks
8. What is the probability that 8 cars meet the emission standards? 2 marks
9. What is the probability that at least 8 cars meet the emission standards? 2 marks