Exercise 1 — Calc. : ✗

Two parabolas y_a and y_b are plotted on the same graph where

$$\begin{cases} y_a = x^2 - 4x \\ y_b = 16 - x^2 \end{cases}$$

Calculate the coordinates for any points of intersection. — 5 marks

Exercise 2 — Calc. : ✗

The function f is defined as follows:

$$f(x) = 4\sqrt{x} - x^2 \qquad x \in \mathbb{R}, x \geq 0.$$

Show that f has a single stationary point and determine if this is a maximum or minimum. — 5 marks

Exercise 3 — Calc. : ✗

A recursive sequence calculates the next term in the sequence from the previous number. Calculate the terms u_2, u_3 and u_4 for the sequence — 5 marks

$$\begin{cases} u_1 = 8 \\ u_{n+1} = \dfrac{1}{2} u_n \end{cases}$$

and state explicitly what type of sequence this is.
Hence calculate the sum to infinity for this sequence.

Exercise 4 — Calc. : ✗

A company sells two printers with an extended warranty; the Grafter and the Elite.
For the first 50 sales of each type of printer the number of claims are recorded as follows:

Claim / Printer	Yes	No
Grafter	15	35
Elite	10	40

A purchaser is selected at random from this group. — 5 marks

1. What is the probability that they made a claim on their printer?

2. Given that they didn't make a claim what is the probability that they bought the Elite?

Exercise 5 — Calc. : ✗

The heights in cm of 7 plants are recorded as follows:
16, 17, 20, 23, 24, 25, 85
Identify any outliers in this data and calculate an adjusted mean. — 5 marks

Exercise 6 — Calc. : ✗

Simon has a 4 digit PIN for his phone but he has forgotten what it is.
He knows that all the digits are different and that zero is not used.
What is the probability that he will find the correct PIN by randomly guessing the digits? — 5 marks