1. A rectangle has its base (one side) on the x-axis, and two vertices on the graph of \( y = 4 - x^2 \). Find an expression for the area of this rectangle in terms of \( x \).

2. Sketch the graphs of:
   a. \( y = x^3 \)
   b. \( y = (x+2)^3 - 1 \)
   c. \( y = 1 - (x+2)^3 \)

1. First we sketch the setting.

Since we know \( y = x^2 \) we readily see that \( y = 4 - x^2 \) is an inverted parabola raised up 4 units.

Then placing a rectangle with a side on the x-axis, and two vertices on \( y = 4 - x^2 \), we see the shaded rectangle as one of many possibilities. Another is outlined.

Since we need the area of the rectangle in terms of \( x \), we locate \( x \) in this scenario...\( x \) (just >1), for the shaded rectangle, is shown. (Where is \( x \) for the outlined rectangle?)

The Area of a rectangle is the product of its two dimensions:

\[
\text{Area} = \text{length} \cdot \text{height} = (2x) \cdot (4 - x^2) = 2x(4 - x^2) \quad (\text{for} \ -2 \leq x \leq 2)
\]