(1) Sketch the graph of \( y = x^3 + x^2 \). What is the slope of the line through \((1, 2)\) and \((x, y)\) when \(x = 0.9\)? \(x = 1.01\)? \(x = 1 + h\)? Explain in your own words what happens when \(h\) is small (i.e., close to zero).

(2) Let \( f(x) = 1 - x^2 \). Find a formula for and sketch the graph of
(a) \(|f(x)|\)
(b) \(f(x^2)\)
(c) \(f(x)^2\)
(d) \(f(x - 1)\)
(e) \(f(x) - 1\)
(f) \(f(f(x))\)

(3) A particle moves counter-clockwise at constant speed 1 around the equilateral triangle with corners \((0, 0), (1, 0)\) and \((1/2, \sqrt{3}/2)\), starting at \((0, 0)\). At each time \(t\) between 0 and 3, the \(x\)-coordinate of the particle is \(x(t)\) and the \(y\)-coordinate of the particle is \(y(t)\).

(a) Write down \(x(t)\) and \(y(t)\) as piecewise functions of \(t\).
(b) Sketch the graphs of \(x(t)\) and \(y(t)\).
(c) Let \(d(t)\) be the distance between the particle and \((0, 0)\) at time \(t\). Write a \(d(t)\) as a piecewise function of \(t\) and roughly sketch its graph.