(1) [8 points] Neatly sketch the graph of the function $f(x) = 3(x+1)^2 - 2$

(2) [**7 points**] Neatly sketch the graph of the function $f(x) = \sqrt{x+1} - 2$

(3) [**5 bonus points**] Reduce to lowest terms:

$$\frac{x^3 + x^2}{x^3 + 1}$$