2. [14 points] Shirley is trying to measure the right amount of sugar into a bowl for 8 seconds. The function \( g(t) \) gives the rate (in cups/second) at which the amount of sugar in the bowl is changing \( t \) seconds after she starts measuring. The graph is linear on the intervals \([2, 3], [3, 5], [5, 8]\), and quadratic on \([0, 2]\) with formula \( g(t) = 6t - 3t^2\):

![Graph of g(t)](image)

Sketch a detailed graph of \( G(t) \), the antiderivative of \( g(t) \), giving the amount of sugar in the bowl at time \( t \) assuming there are 5 cups of sugar in the bowl after 3 seconds. Only graph \( G(t) \) on the interval \([0,8]\). Make sure to clearly label the output and input of the points at \( t = 0, 2, 3, 5, 8 \). Be sure to make it clear where the graph is concave up, concave down, or linear and where it is increasing or decreasing. Use hand-drawn axes similar to those given below.

![Graph of G(t)](image)