2. [15 points] The function \( g(x) \) is graphed below. The area of the shaded region is 5.5. The function \( g(x) \) is piecewise linear for \( x > -1 \).

On the axes provided below, sketch a continuous antiderivative \( G(x) \) of \( g(x) \) with domain \([-6, 6]\), satisfying \( G(1) = 1 \). Make sure to clearly label the input and output values at \( x = -6, -1, 2, 4, \) and 6. Be sure to make it clear where \( G(x) \) is **concave up**, **concave down**, or **linear**, and where it is **increasing**, **decreasing**, or not **differentiable**.
Solution: The input/output values at the specified points are labeled in the figure. The graph of $G(x)$ should be concave up on $(-6,-3.5)$, $(0,2)$, and $(4,6)$, concave down on $(-3.5,-1)$, and linear on $(-1,0)$ and $(2,4)$. The function $G(x)$ is increasing on $(-6,-1)$ and $(1,4)$ and decreasing on $(0,1)$ and $(4,6)$. The function $G(x)$ is not differentiable at $(0,1.5)$ and $(4,3.5)$. 