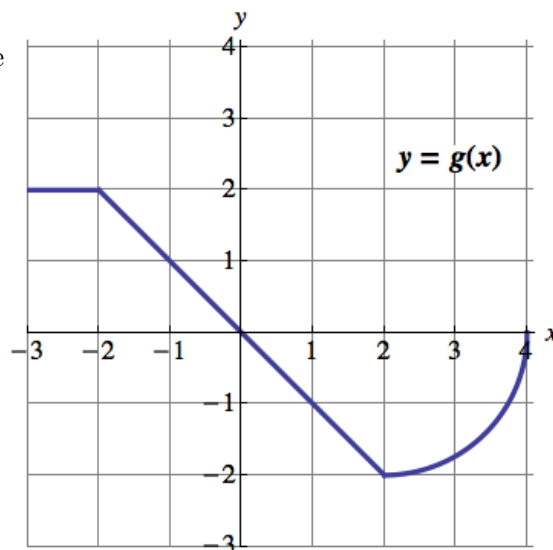**5.** [15 points]

   a. [11 points]　Let $G(x) = \int_{-2}^{x} g(t)dt$ where the graph of the function $g(x)$ is shown below.
The graph of $g(x)$ is a quarter of a circle for $2 \leq x \leq 4$.

Fill in the indicated values of $G(x)$ in the table below.

x	-3	-2	0	2	4
$G(x)$					

Draw the graph of $G(x)$ for $-3 \leq x \leq 4$. Make sure your graph indicates the regions where the function $G(x)$ is increasing, decreasing, concave up or concave down, and appropriately reflects the critical points of $G(x)$.
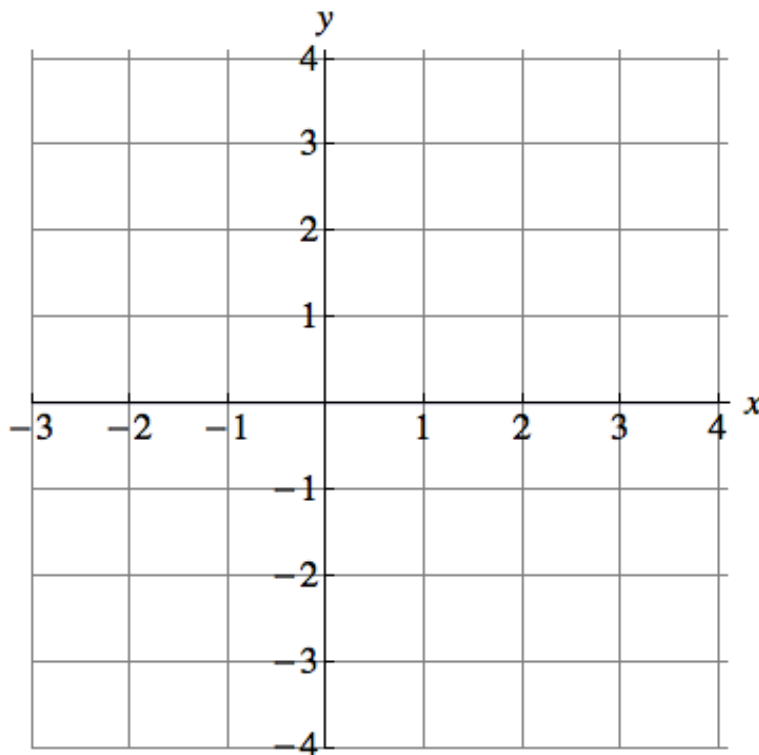
b. [4 points] Consider the function

$$f(x) = \begin{cases} -x & \text{for } x \le 0 \\ x^2 & \text{for } 0 < x. \end{cases}$$

Let $F(x)$ be an antiderivative of $f(x)$ with $F(-2) = 0$. Find a formula for $F(x)$. Your answer should not include any integrals.

$$F(x) = \begin{cases} \underline{\hspace{3cm}} & \text{for } x \le 0 \\ \\ \underline{\hspace{3cm}} & \text{for } 0 < x. \end{cases}$$