3. [9 points] The graph of \( g(t) \) and the areas \( A_1, A_2 \) and \( A_3 \) between its graph and the \( t \) axis are shown below.

Let
\[
H(x) = \int_{3}^{x} g(t) \, dt \quad \text{and} \quad F(x) = \int_{0}^{x} g(t) \, dt.
\]

a. [5 points] Find \( H(1), H(2) \) and \( H'(3) \).

\[\begin{align*}
H(1) &= \int_{3}^{3} g(t) \, dt = 0 \\
H(2) &= \int_{3}^{6} g(t) \, dt = -2.5 \\
H'(3) &= 3g(9) = 6.
\end{align*}\]

b. [2 points] For what values of \( 5 \leq x \leq 10 \) is \( F(x) \) increasing?

\[\text{Solution:} \quad 6 \leq x \leq 10.\]

c. [2 points] For what values of \( 5 \leq x \leq 10 \) is \( F(x) \) concave up?

\[\text{Solution:} \quad 5 \leq x \leq 8.\]