6. (7 points) The derivative of a continuous function \( g \) is given by

\[
g'(x) = \frac{e^{-2x}(x + 2)(x - 3)^2}{(x - 5)^{1/3}}.
\]

Determine all critical points of \( g \), and classify each as a local maximum, a local minimum, or neither. Carefully explain your reasoning for each classification.

7. (8 points) Use the following figure, which shows a graph of \( f(x) \), to find each of the indicated integrals, given that the first area (with the darker shading) is 12 units and the second area is (with the lighter shading) is 3 units.

\[
\begin{align*}
(a) & \int_a^b f(x) \, dx \\
(b) & \int_a^c |f(x)| \, dx \\
(c) & \int_c^b f(x) \, dx \\
(d) & \int_a^b 2(f(x) + 3) \, dx 
\end{align*}
\]