1. Two sharks are traveling from a coral reef out to sea. The distance of the two sharks from the coral reef is modeled by the equations

\[ s_1(t) = 7 + t + 3t^2 \]
\[ s_2(t) = 3t \]

where \( s_1 \) and \( s_2 \) are the distances of the first and second shark measured in miles and \( t \) is measured in hours. What is the average distance in miles between the two sharks for the first three hours if they travel along the same straight path? Do not forget to include units.

\[
S_{\text{avg}} = \frac{1}{3} \int_0^3 [(7 + t + 3t^2) - (3t)] \, dt
\]

\[
= \frac{1}{3} \int_0^3 (7 - 2t + 3t^2) \, dt
\]

\[
= \frac{1}{3} \left[ 7t - t^2 + t^3 \right]_0^3
\]

\[
= \frac{1}{3} \left[ 21 - 9 + 27 \right]
\]

\[
= \frac{1}{3} \left[ 39 \right]
\]

\[
= 13 \text{ miles}
\]