

$$\begin{aligned}
(1) S(x) &= \frac{1}{x^2} \int_0^{ax} (2\sin t - t \cos t) dt \\
&= \frac{1}{x^2} [-2\cos t]_0^{ax} - \frac{1}{x^2} \int_0^{ax} t (\sin t)' dt \\
&= \frac{1}{x^2} [-2\cos t - t \sin t]_0^{ax} + \frac{1}{x^2} \int_0^{ax} \sin t dt \\
&= \frac{1}{x^2} [-2\cos t - t \sin t - \cos t]_0^{ax} \\
&= \frac{1}{x^2} [-3\cos t - t \sin t]_0^{ax} \\
&= \frac{1}{x^2} (-3\cos ax - ax \sin ax + 3 \times 1) \\
&= \boxed{\frac{1}{x^2} (3 - 3\cos ax - ax \sin ax)}
\end{aligned}$$

$$\begin{aligned}
(2) \lim_{x \rightarrow 0} S(x) &= \lim_{x \rightarrow 0} \left( \frac{3}{x^2} \times \frac{1 - \cos ax}{2} \times 2 - \frac{a \sin ax}{x} \right) \\
&= \lim_{x \rightarrow 0} \left\{ \frac{6}{x^2} \times \sin^2\left(\frac{ax}{2}\right) - a^2 \times \frac{\sin ax}{ax} \right\} \\
&= \lim_{x \rightarrow 0} \left\{ \left( \frac{\sin \frac{ax}{2}}{\frac{ax}{2}} \right)^2 \times \frac{6}{\frac{4}{a^2}} - a^2 \times \frac{\sin ax}{ax} \right\} \\
&= 1^2 \times \frac{6a^2}{4} - a^2 \times 1 \\
&= \frac{3}{2}a^2 - a^2 \\
&= \boxed{\frac{1}{2}a^2}
\end{aligned}$$