Let \( f_a(x) = x^{-1/4} \delta(x-a) \), with \( a > 0 \).

Let \( \Phi_a[t] = \int_a^{\infty} \frac{t(x)}{x^{1/4}} \, dx \).

Then \( \Phi_a'[t] = \frac{t(a)}{a^{1/4}} - \frac{1}{4} \int_a^{\infty} \frac{t(x)}{x^{3/4}} \, dx \).

From a line on p. 1 of the solution of the previous problem, we have:

\[
\Phi_a'[t] = \int_a^{\infty} t(x) \left[ -\frac{\partial \delta(x-a)}{4 \pi^{1/4}} + \frac{\delta'(x-a)}{a^{1/4}} \right] \, dx.
\]

with the usual notation. Now

\[
\int_a^{\infty} t(x) \delta(x-a) \, dx - \int_a^{\infty} t(x) \delta'(x-a) \, dx = t(a) - \frac{t'(a)}{a} = O(a)
\]

So \( \Phi_a'[t] = \int_a^{\infty} t(x) \left[ -\frac{\partial \delta(x-a)}{4 \pi^{1/4}} + \frac{\delta'(x-a)}{a^{1/4}} \right] \, dx + O\left(\frac{1}{a^{1/4}}\right) \).

The limit as \( a \to 0 \) is the result for \( p'[t] \) in the previous problem. The quantity in square brackets is the ordinary derivative

\[
\frac{1}{3^{1/4}} \text{ times a } O \text{-function plus a } \delta \text{-function at } x = 0 \text{ with coefficient } \frac{1}{4 \pi^{1/4}}.
\]

We can think of this as the ordinary derivative \( -\frac{1}{4 \pi^{1/4}} \) plus a coefficient \( \frac{1}{3^{1/4}} \) times a \( \delta \)-function. The coefficient is infinite at \( a = 0 \).