Special Problem II.A-54

The scattering parameter S_{21} for a certain microwave **filter** has the form:

$$S_{21}(\omega) = \frac{10^7}{10^7 + \omega^2} e^{-j\left[\omega(0.002 + A\omega) + B\right]}$$

Where A and B are some unknown **constants**.

But, it **is** know that the **phase delay** of this filter at frequency $\omega = 100$ is **0.004 seconds**.

Determine precisely (i.e., without any unknowns!) the phase delay of the filter at $\omega = 200$.