8. 100ft of cable with $t_p = 175\,ns$ + total capacitance (C) = 2000pF
What is Z_0?

method A: $\mathcal{C} = \frac{2000\,pF}{100\,ft} = 20\frac{pF}{ft}$

$v_p = \frac{100\,ft}{175\,ns} = 0.5714\frac{ft}{ns}$

since $\mathcal{C} = \frac{1}{Z_0 v_p}$; $Z_0 = \frac{1}{\mathcal{C} v_p} = \frac{1}{20\frac{pF}{ft} \cdot .5714\frac{ft}{1\times10^{-9}s}} = \underline{\underline{87.5\,\Omega}}$

method B: total delay $= \sqrt{LC}$

$175\times10^{-9}s = \sqrt{L \cdot 2000\times10^{-9}F}$

$3.063\times10^{-14}\,ns^2 = L \cdot 2000^{-9}F$

$L = 1.531\times10^{-5}H$

$Z_0 = \sqrt{\frac{\mathcal{L}}{\mathcal{C}}}$ or $\sqrt{\frac{L}{C}} = \sqrt{\frac{1.531\times10^{-5}}{2000\times10^{-9}}} = \underline{\underline{87.5\,\Omega}}$