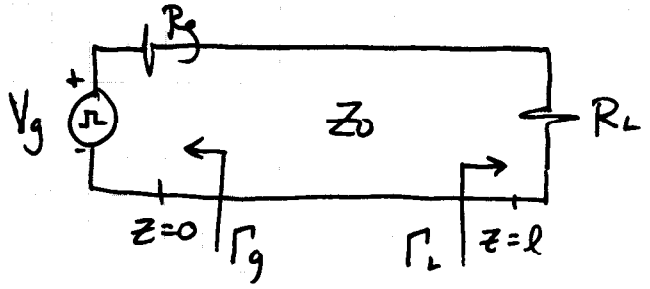
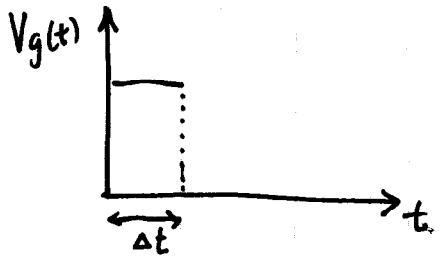
PULSED TRANSIENTS





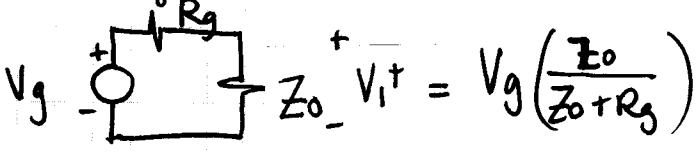
① Calculate

$$\Gamma_L = \frac{R_L - Z_0}{R_L + Z_0} \qquad \Gamma_g = \frac{R_g - Z_0}{R_g + Z_0}$$

Time delay from $z=0$ to ℓ

$$\tau = \ell / v_p$$

Voltage incident on the line

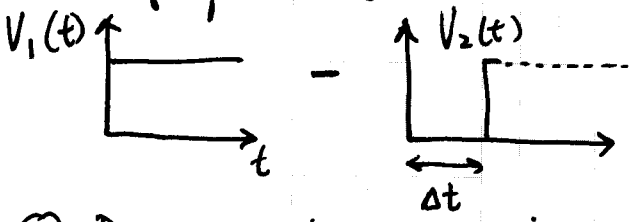


All other voltages

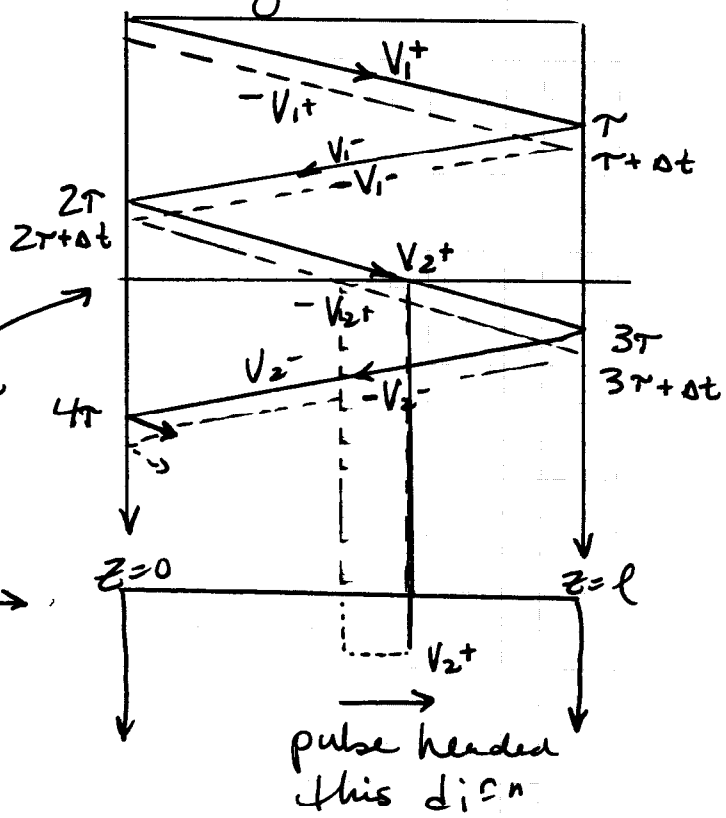
$$V_1^- = V_1^+ \Gamma_L \qquad V_2^+ = \Gamma_g V_1^-$$

$$V_2^- = V_2^+ \Gamma_L \quad \ldots$$

② Observe that the pulse is the sum of two step functions ...



③ Draw a bounce diagram showing $V_1(t)$ & $V_2(t)$



④ Find voltage @ $t = 2.5\tau$ on the line

Note use of solid & dashed lines to show leading & lagging edge of pulse.

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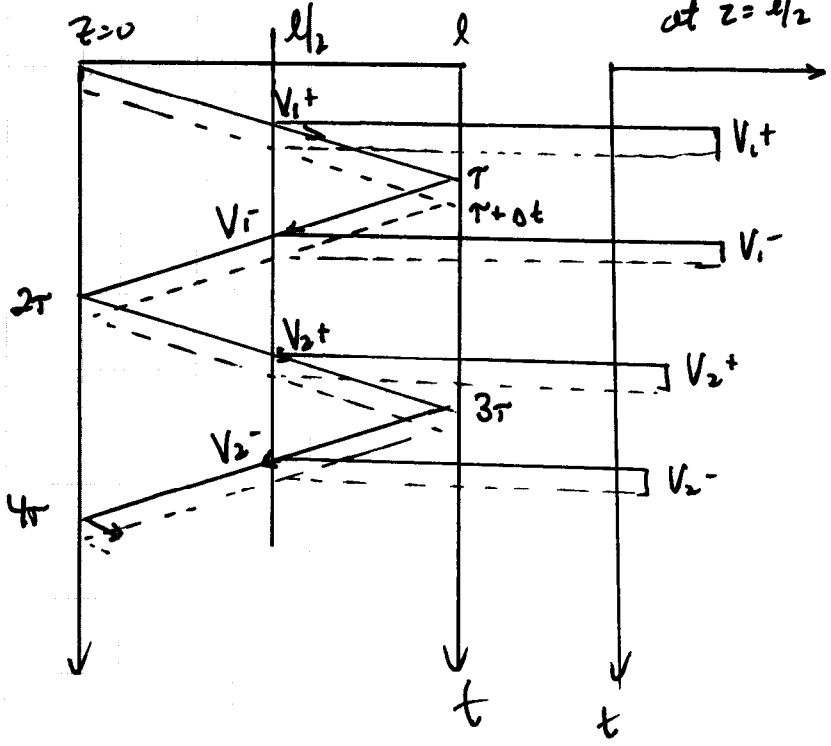
PULSED TRANSIENTS (2)

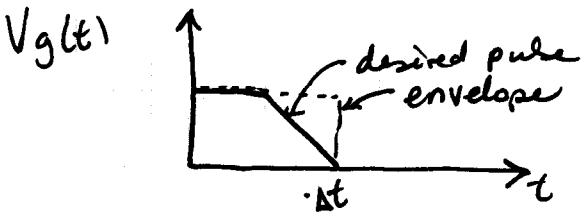
⑤ Find the voltage as a function of time at $z = \ell/2$



These may be ⊕ or ⊖ depending on your calculations.

Note solid, dashed lines

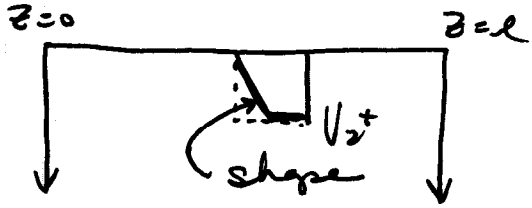
Now, if pulse has a shape, use an envelope as shown



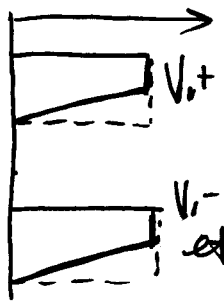
Solve the problem as above for the rectangular envelope (pulse width Δt).

Then redraw, using the solid & dashed lines to guide you

Part ④ Becomes:



Part ⑤ Becomes



I'm blowing up the picture...

etc.