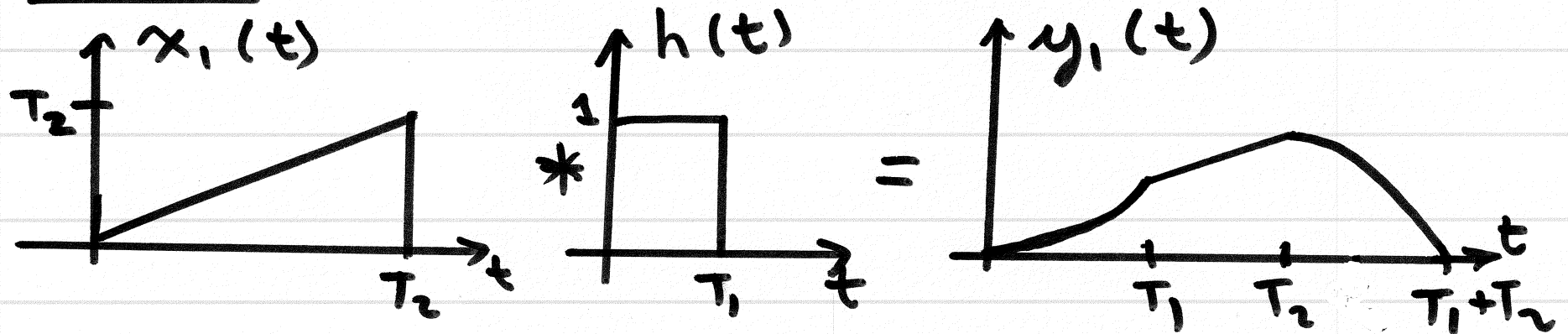
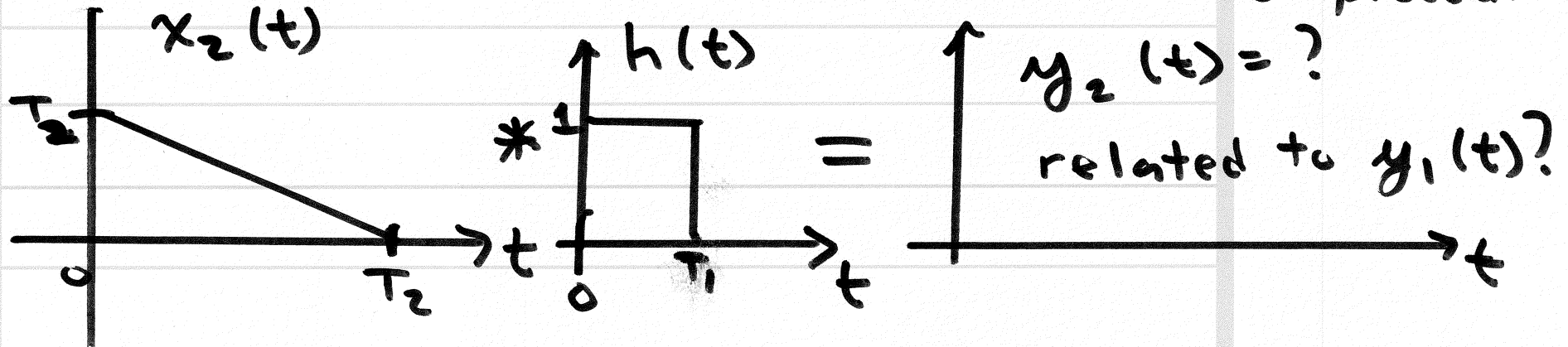


## Observations on Convolution of Rectangle with Ramp-Up / Ramp-Down Triangle

• Given the following convolution:



• Can we find convolution below without having to graphically work thru the convolution procedure?



• Observations:

$$x_2(t) = x_1(-(t - T_2))$$

$$h(t) = h(-(t - T_1))$$

• Since  $y_1(t) = x_1(t) * h(t)$ , it follows

$$y_1(-t) = x_1(-t) * h(-t)$$

• Now:  $y_2(t) = x_2(t) * h(t)$

$$y_2(t) = x_1(-(t - T_2)) * h(-(t - T_1))$$

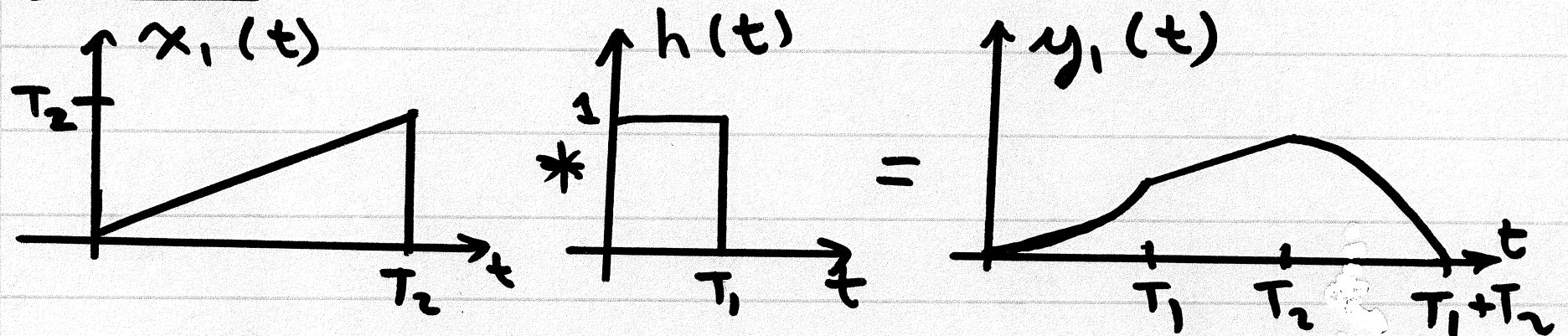
compare

• Thus:  $y_2(t) = y_1(-(t - [T_1 + T_2]))$

$y_2(t)$  is  $y_1(t)$  flipped (time-reversed) and then shifted to the right to start at  $t = 0$

## Observations on Convolution of Rectangle with Ramp-Up / Ramp-Down Triangle

• Given the following convolution :



Answer:  $y_2(t) = y_1(-(t - (T_1 + T_2)))$

