EE100 Pre-Lab: **Nonlinear Circuit Synchronization Phenomenon and Design of Frequency Dividers**

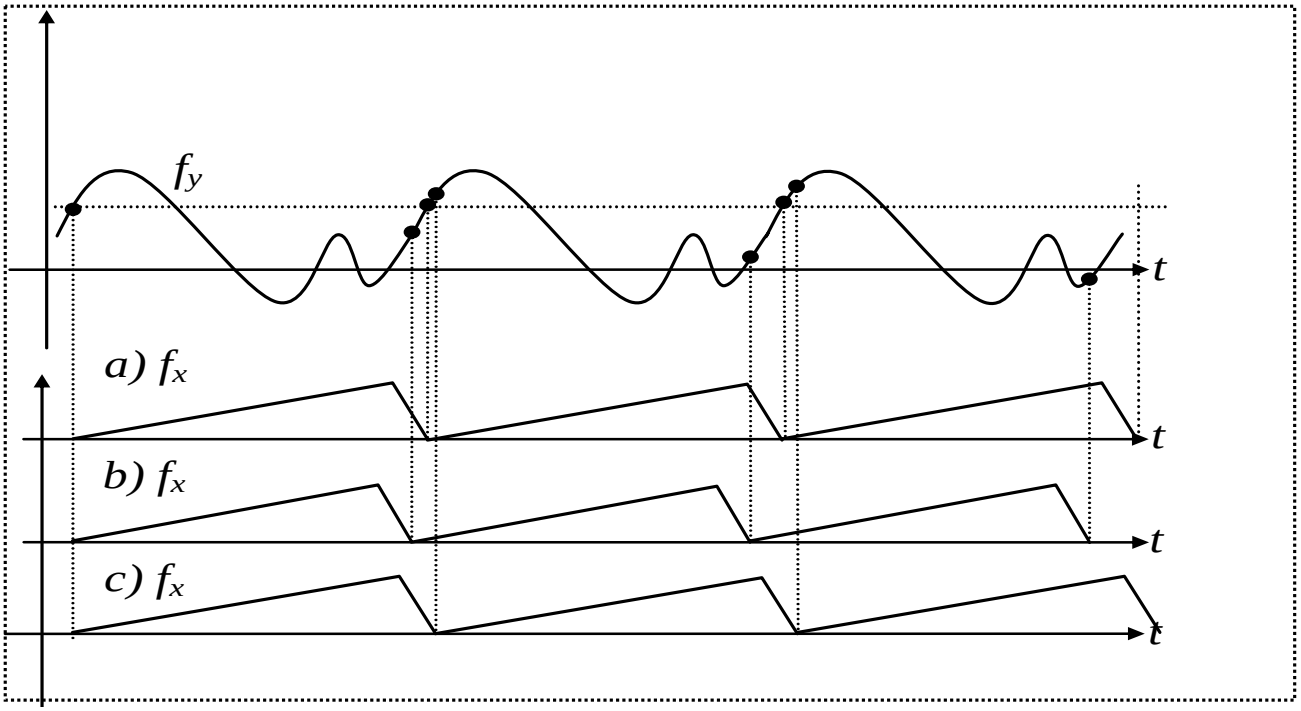
Name:_____

TA: _____

Section:_____

To display a periodic signal stationary on the oscilloscope screen, it is necessary that the input signal (vertical draw) and the sawtooth waveform (horizontal draw) be "synchronized" at all times. This means that the beginning of each sweep must occur at the same position on the input waveform.
a) Consider the following periodic signal f_y and find the f_x sawtooth waveform which is synchronized with the input signal.

answer:



b) Which f_x sawtooth waveform has slightly lower frequency and which one has slightly greater frequency?
answer:

c) If the sawtooth waveform is not synchronized to the input signal (frequencies differ slightly) then the displayed waveform will drift slowly to the left or to the right. Find the answer for each case (stationary, drifts left, drifts right).
answer:

1:
2:
3: