EXERCISE 5.9: Test the system defined by the equation
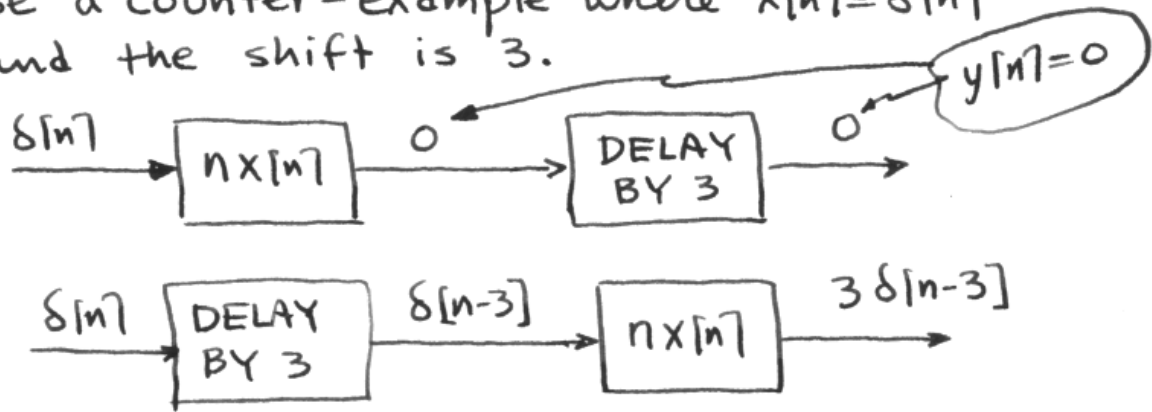
$$y[n] = nx[n]$$

to determine whether it is a time-invariant system.

SOLUTION

$y[n] = n x[n]$ is <u>NOT</u> time-invariant.

Use a counter-example where $x[n] = \delta[n]$
and the shift is 3.

The outputs are <u>NOT</u> equal so the
system is <u>NOT</u> time-invariant