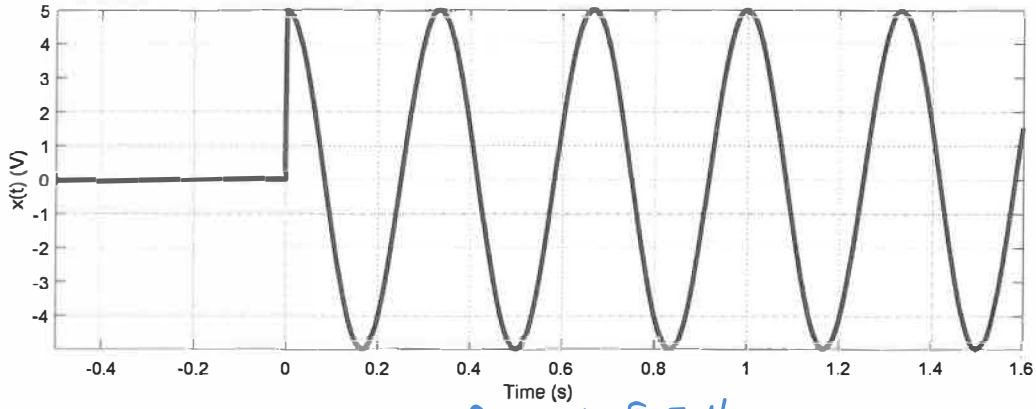
Name ANSWERS

EE3032 – Dr. Durant – Quiz 1
Fall 2019, Week 1



↳ $2\pi f t = 6\pi t \Rightarrow f = 3\ Hz$

1. (7.5 points) Given x(t) = u(t) cos(6πt), which is plotted in the figure above, plot the following functions. Note that u(t) is 1 for x≥0 and 0 otherwise; thus it forces the product to 0 when x<0. So, the sinusoid continues forever off the right side of the graph.
   a. f(t) = x(2t)
   b. g(t) = x(t+1)
   c. h(t) = x(2t-4)
2. (1.5 points) Which of the following functions are causal?
   a. x(t)
   b. g(t) as you drew it
   c. h(t) as you drew it

f & h are causal since value = 0 for $t<0$
g is not causal since $\neq 0$ for some $t<0$, e.g. $g(-1)=5$

3. (1 point) Write an expression for an anti-causal signal as a simple transformation of x(t). → mirror: $t \to -t$

$x(t) = u(t)\cos(6\pi t)$
$a(t) = x(-t) = u(-t)\cos(6\pi \cdot -t)$
$= u(-t)\cos(6\pi t)$
↑ can drop - since cos is even

(1)(a) Contraction by 2, f increases

(b) Time delay by -1s or Time advance by 1s

(c) $h(t) = x(2t-4) = x(2(t-2))$

② contract by 2x, so fcn @ 4s is moved in towards 0 by 2x, arriving @ 2s

① delay by 4

① compress/contract by 2x

② delay by 2s

Way we did in class