CSE Department, North South University

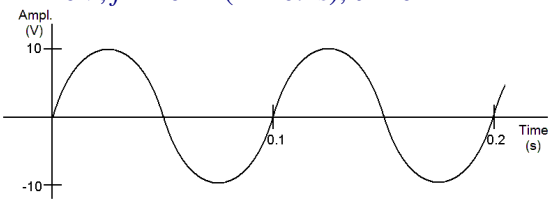
ETE131: Introduction to Telecommunications & Computer Engineering (SyR)

Problem Sheet 4: Time and Frequency Domain Plots - Solutions

1. Draw the time domain plot for the following waves:

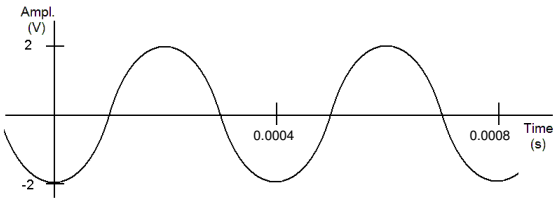
- $s(t) = 10\ \mathrm{Sin}(20\ \pi\ t)$

$A = 10\mathrm{V}, f = 10\mathrm{Hz}\ (T = 0.1\mathrm{s}), \theta = 0$



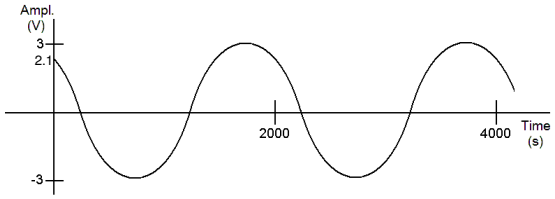
- $s(t) = 2\ \mathrm{Sin}(15710t - 1.571)$

$A = 2\mathrm{V},\ f = 2500\mathrm{Hz}\ (T = 0.0004\mathrm{s}), \theta = -\frac{1}{2}\pi$

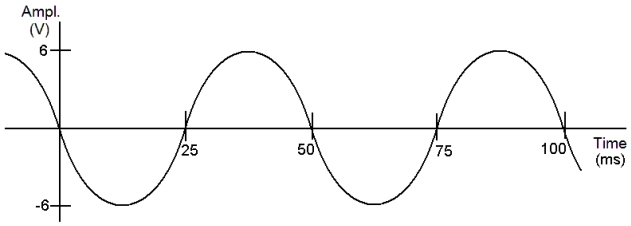


- $s(t) = 3\ \mathrm{Sin}(0.001\pi t + \frac{3}{4}\pi)$

$A = 3\mathrm{V}, f = 0.0005\mathrm{Hz}\ (T = 2000\mathrm{s}), \theta = \frac{3}{4}\pi$

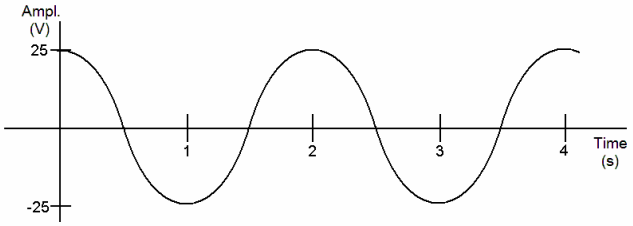


2. Write the equation for the following sine waves:



$A = 6\mathrm{V}, T = 0.05\mathrm{s}\ (f = 20\mathrm{Hz}), \theta = +\pi$ or $-\pi$

$s(t) = 6\ \mathrm{Sin}\ (40\ \pi\ t + \pi)$ or $6\ \mathrm{Sin}\ (40\ \pi\ t - \pi)$

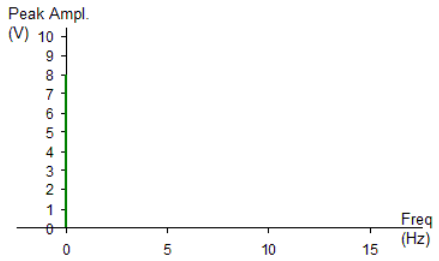


$A = 25\mathrm{V}, T = 2\mathrm{s}\ (f = 0.5\mathrm{Hz}), \theta = +\frac{1}{2}\pi$

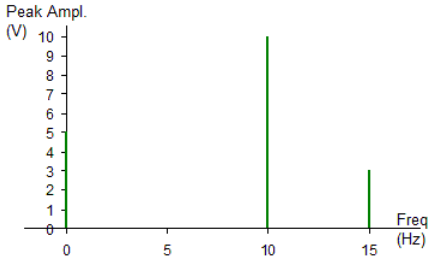
$s(t) = 25\ \mathrm{Sin}\ (\pi\ t + \frac{1}{2}\pi)$

3. Draw the frequency spectrum (frequency domain plot) for the following waves

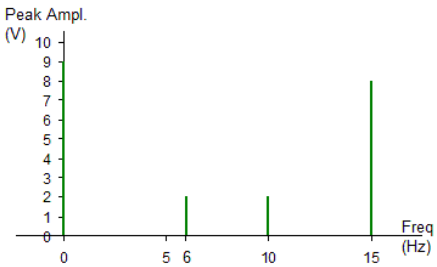
- $s(t) = 8$



- $s(t) = 5 + 10\ \mathrm{Sin}(20\ \pi\ t) + 3\ \mathrm{Sin}(30\ \pi\ t + \frac{3}{4}\pi)$



- $s(t) = 2\ \mathrm{Sin}(20\ \pi\ t - 0.33) + 8\ \mathrm{Sin}(30\ \pi\ t + \frac{3}{4}\pi) + 2\ \mathrm{Sin}(37.704\ t - 1.51) + 9$



syedur.rahman@wolfson.oxon.org - 25/05/2008