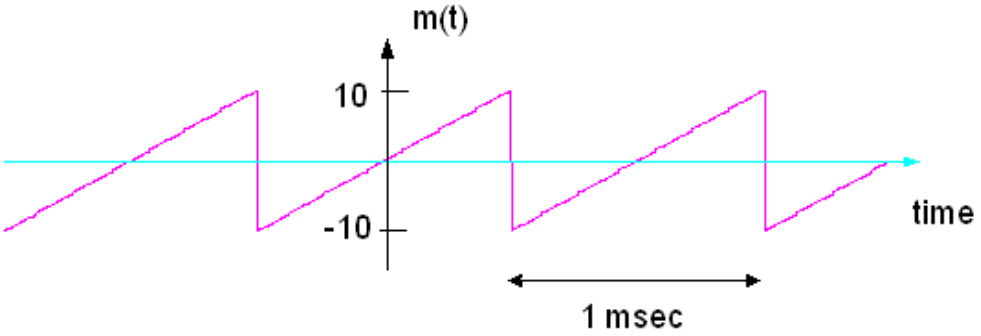
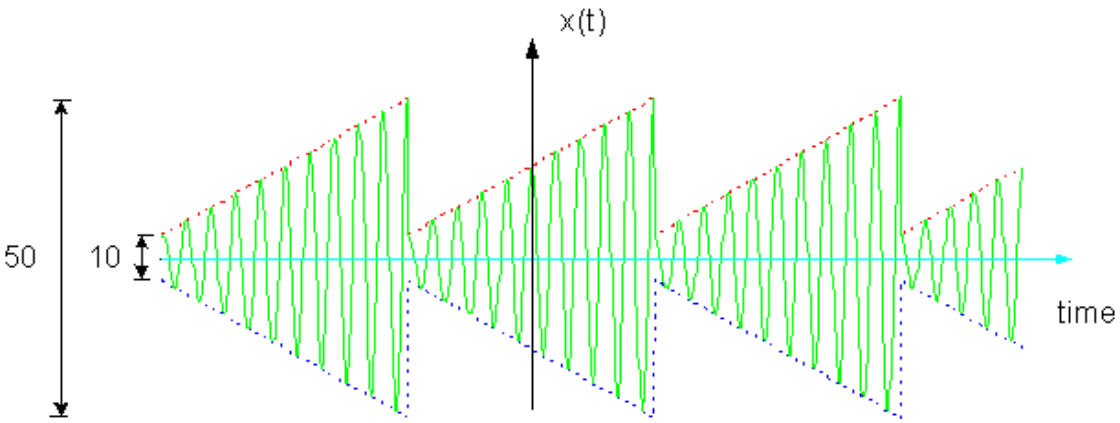
Quiz 4

(25th February 2014)

The signal $m(t)$ is amplitude modulated. The resultant modulated signal $x(t)$ is as shown below. What is the modulation index?





The AM modulated signal is

$$x(t) = \Big(A + m(t)\Big) \cos 2\pi f_c t$$

We note from the diagram of $m(t)$ that

$$\max m(t) = 10, \quad \min m(t) = -10.$$

We also note from the diagram of $x(t)$ that

$$A + \max m(t) = 25 \qquad \Rightarrow \qquad A = 25 - 10 = 15$$

The modulation index is

$$m = \frac{\min m(t)}{A} = \frac{10}{15} = \frac{1}{3}.$$