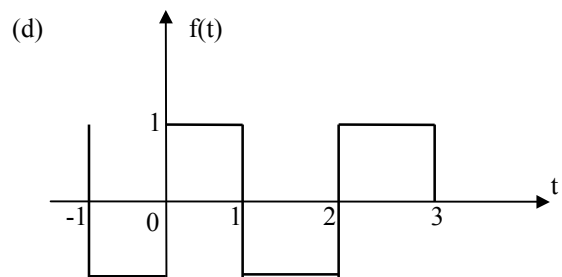
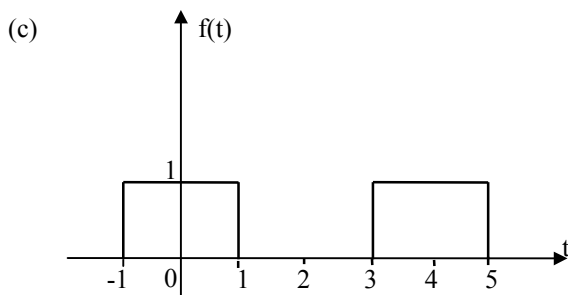
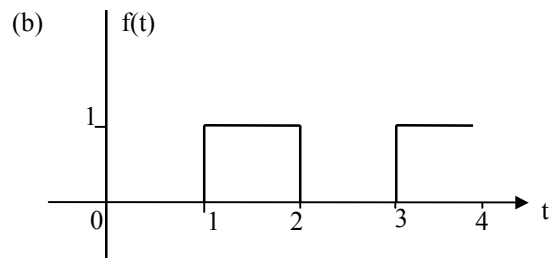
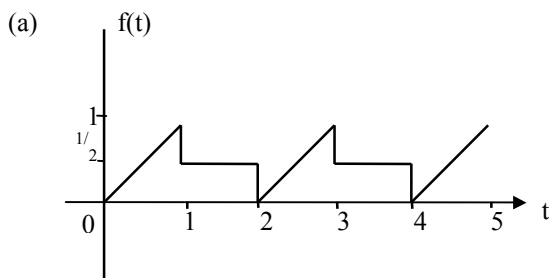


# MATHEMATICS FOR AERO/MECHANICAL ENGINEERS

## TUTORIAL SHEET 7A

### PERIODIC FUNCTIONS

1. Define analytically the periodic functions shown



2. Sketch graphs of the following, inserting relevant values

(a)  $f(t) = t^2 \quad 0 \leq t \leq 1$   
period 1

(b)  $f(t) = \begin{cases} t^2 & -1 \leq t \leq 0 \\ t & 0 \leq t \leq 1 \end{cases}$   
period 2

(c)  $f(t) = \begin{cases} \sin t & 0 < t \leq \pi \\ 0 & \pi < t \leq 2\pi \end{cases}$   
period  $2\pi$

(d)  $f(t) = \begin{cases} \frac{t^2}{4} & 0 < t \leq 4 \\ 4 & 4 < t \leq 6 \\ 0 & 6 < t \leq 8 \end{cases}$

Note: This is also written

$$f(t) = \begin{cases} \sin t & 0 < t \leq \pi \\ 0 & \pi < t \leq 2\pi \end{cases}$$

$$f(t) = f(t + 2\pi)$$

Period  $T = 2\pi$

$$f(t) = f(t + 8)$$

i.e. period 8