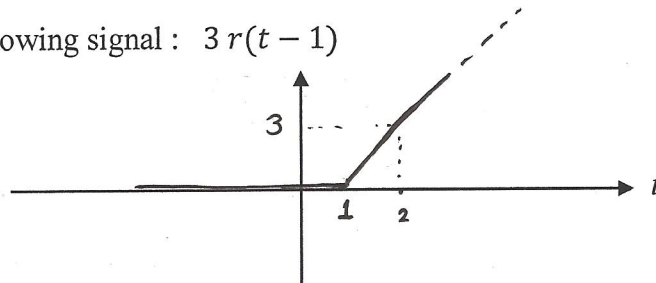


Name: **KEY**

ver.1

a) Sketch the following signal : $3r(t-1)$ (2 points)



b) For the following signal : $4 \cos(10t + \pi/4)$

a. What is the fundamental frequency in Hz? (1 point)

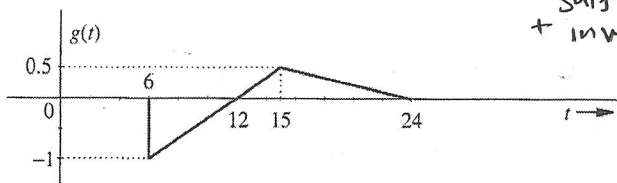
$$\omega = 10 \text{ rad/sec} \Rightarrow f = \frac{\omega}{2\pi} = \frac{10}{2\pi} = \frac{5}{\pi} \text{ Hz}$$

$$\omega = 2\pi f$$

b. What is the period? (1 point)

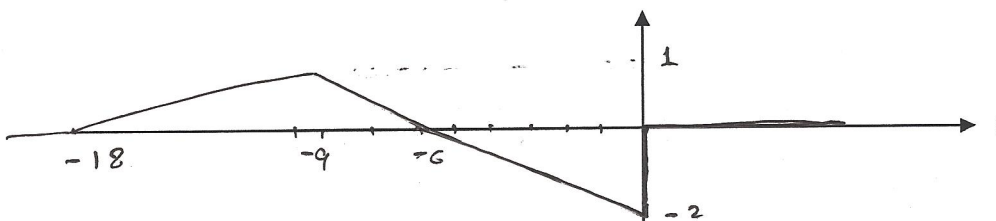
$$f = \frac{1}{T} \Rightarrow \frac{\pi}{5} = T$$

c) For the signal $g(t)$ shown in the Figure, sketch the signal $2g(6-t)$ (4 points)



scale by 2
 shift 6 units + invert
 $\tau = 6 - t$
 $\Rightarrow t = 6 - \tau$

τ	6	12	15	24
t	0	-6	-9	-18



d) What is the frequency of the following signal? (2 points)

$$x(t) = 5 \cos\left(12t + \frac{\pi}{2}\right) + 3 \sin\left(5t + \frac{\pi}{12}\right)$$

$\omega_1 = 12, \omega_2 = 5$, ω for the sum is the greatest common factor which is 1 \Rightarrow $\omega = 1 \text{ rad/sec}$ or $f = 2\pi \text{ Hz}$

You can also use the method in the book.