1. a) Convert the following into radians: $300^\circ$  

   (1 point)

   b) Find the amplitude and the period of: $g(t) = 5 \sin \left( \frac{\pi(t-2)}{6} \right)$  

   (2 points)

2. If $\lim_{x \to 3} g(x) = 4$, calculate the $\lim_{x \to 3} 2^{g(x)}$  

   (3 points)

3. Find the values of $x$ for which the following function is discontinuous and find the value of the function, the left and the right limit at these points. 

   $f(x) = \begin{cases} 
   x^2 + x - 12, & \text{if } x \leq 1 \\
   3 - x, & \text{if } x > 1 
   \end{cases}$  

   (4 points)
SOLUTIONS OF QUIZ 2

1. a) \(2\pi \text{ rad} = 360^\circ \Rightarrow 1^\circ = \frac{2\pi}{360} \text{ rad} \Rightarrow 300^\circ = \frac{2\pi}{360} \times 300 = \frac{10\pi}{6} = \frac{5\pi}{3} \text{ rad.}\)

b) The equation can be rewritten as: \(g(t) = 5 \sin \left(\frac{\pi t}{6} - \frac{\pi}{3}\right)\). So the amplitude is \(a=5\) and the period is equal to \(T = \frac{2\pi}{\frac{\pi}{6}} = 12\).

2. \(\lim_{x \to 3} 2g(x) = 2 \lim_{x \to 3} g(x) = 2^4 = 16\)

3. The function is continuous in each of its branches. It suffices to see what is happening at the value of \(x=1\).

Then, the left limit will be \(\lim_{x \to 1^-}(x^2 + x - 12) = 1^2 + 1 - 12 = -10\) and the right limit will be \(\lim_{x \to 1^+}(3 - x) = 3 - 1 = 2\).

So at the value \(x=1\) the function is discontinues. There, the value of the function will be \(f(1) = 1^2 + 1 - 12 = -10\)