Instituto Superior de Engenharia de Coimbra
DEPARTAMENTO DE FÍSICA E MATEMÁTICA

ANÁLISE MATEMÁTICA I - **Engenharia Informática**

TPC nº1 — Data limite de entrega: 6/Out/2015 (23h59m)

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1. Calcule o valor da seguinte expressão numérica. Ilustre no círculo trigonométrico todos os cálculos que realizar.

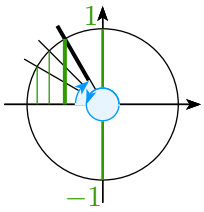
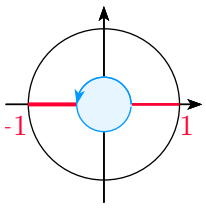
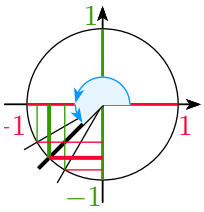
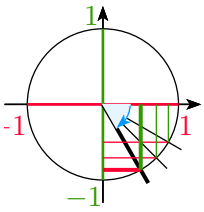
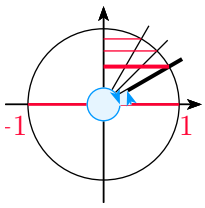
$$\sin\left(\frac{32\pi}{3}\right) + \cos(17\pi) + \tan\left(\frac{13\pi}{4}\right) + \cot\left(-\frac{\pi}{3}\right) + \sec\left(-\frac{11\pi}{6}\right).$$

Observações:

- $\tan x = \dfrac{\sin x}{\cos x}$ *(ver página 11 das Tabelas de Matemática)*
- $\cot x = \dfrac{\cos x}{\sin x}$ *(ver página 11 das Tabelas de Matemática)*
- $\sec x = \dfrac{1}{\cos x}$ *(ver página 1 das Tabelas de Matemática)*
- $\csc x = \dfrac{1}{\sin x}$ *(ver página 1 das Tabelas de Matemática)*

Sugestão de resolução:

$\sin\left(\frac{32\pi}{3}\right)$	$+\cos(17\pi)$	$+\tan\left(\frac{13\pi}{4}\right)$	$+\cot\left(-\frac{\pi}{3}\right)$	$+\sec\left(-\frac{11\pi}{6}\right)$
$=\sin\left(\frac{32\pi}{3}\right)$	$+\cos(17\pi)$	$+\dfrac{\sin\left(\frac{13\pi}{4}\right)}{\cos\left(\frac{13\pi}{4}\right)}$	$+\dfrac{\cos\left(-\frac{\pi}{3}\right)}{\sin\left(-\frac{\pi}{3}\right)}$	$+\dfrac{1}{\cos\left(-\frac{11\pi}{6}\right)}$

$\frac{32\pi}{3} = 11\pi - \frac{\pi}{3}$	17π	$\frac{13\pi}{4} = 3\pi + \frac{\pi}{4}$	$-\frac{\pi}{3}$	$-\frac{11\pi}{6} = -2\pi + \frac{\pi}{6}$
				

$=\frac{\sqrt{3}}{2}$	$+(-1)$	$+\frac{-\frac{\sqrt{2}}{2}}{-\frac{\sqrt{2}}{2}}$	$+\frac{\frac{1}{2}}{-\frac{\sqrt{3}}{2}}$	$+\frac{1}{\frac{\sqrt{3}}{2}}$
$=\frac{\sqrt{3}}{2}$	-1	$+1$	$-\frac{\sqrt{3}}{3}$	$+\frac{2\sqrt{3}}{3}$
$=\frac{\sqrt{3}}{2}+\frac{\sqrt{3}}{3}$				
$=\frac{5\sqrt{3}}{6}$				