UNIVERSIDAD DE CONCEPCION
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Solución Listado 7 (Funciones Circulares I)

1. $P(\frac{5\pi}{6}) = (-\sqrt{3}2, \frac{1}{2})$ (II); $\quad P(\frac{2\pi}{3}) = (-\frac{1}{2}, \frac{\sqrt{3}}{2})$ (II);
   $P(-\frac{\pi}{6}) = (\frac{\sqrt{3}}{2}, -\frac{1}{2})$ (IV); $\quad P(3\pi) = (-1, 0)$ (eje X).

2. a) I o IV, b) I o II, c) III o IV, d) II o III.

5. a) $\{\frac{\pi}{3} + 2k\pi : k \in \mathbb{Z}\} \cup \{\frac{2\pi}{3} + 2k\pi : k \in \mathbb{Z}\}$
   b) $\{\frac{\pi}{4} + k\pi : k \in \mathbb{Z}\}$

6. $tan(x_1 + x_2) = \frac{3\sqrt{5}-8}{6+4\sqrt{5}}$

7. El periodo de f_1 es π, el de f_2 es $2\sqrt{3}\pi$ y el de f_3 es 2π.

8. $(cos(x), sen(x)) = (\frac{3}{5}, \frac{4}{5})$.

10. a) $\text{sen}(\alpha + \beta) = \frac{49}{125}$, $\text{sen}(\alpha - \beta) = \frac{123}{125}$
    b) $\cos(\alpha + \beta) = -\frac{44}{125}$, $\cos(\alpha - \beta) = \frac{100}{125}$
    c) $\tan(\alpha + \beta) = -\frac{49}{44}$,$\tan(\alpha - \beta) = \frac{123}{100}$

12. $S_n = \cot(\frac{\alpha}{2}) - \cot(2^{n-1}\alpha)$

13. a) $\text{sen}(\alpha)\cos(\frac{\pi}{4} - \alpha) + \cos(\alpha)\cos(\frac{\pi}{4} + \alpha) = \frac{\sqrt{2}}{2}$
    b) $\cos(\alpha)\cos(\frac{\pi}{6} + \alpha) + \text{sen}(\alpha)\cos(\frac{\pi}{3} - \alpha) = \frac{\sqrt{3}}{2}$

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