GUÍA TRIGONOMETRÍA

I. Demostrar las siguientes identidades trigonométricas:

1. $sec(\alpha) \cdot \frac{1}{\cos(\alpha)} + csc(\alpha) \cdot \frac{1}{sen(\alpha)} = sec^2(\alpha) \cdot csc^2(\alpha)$
2. $\frac{sec(\alpha) + tg(\alpha)}{1 + sen(\alpha)} = sec(\alpha)$
3. $\frac{sec(\alpha)}{\cos(\alpha)} - \frac{tg(\alpha)}{cotg(\alpha)} = 1$
4. $(sec(\alpha) - tg(\alpha))(csc(\alpha) + 1) = cotg(\alpha)$
5. $(1 - sen(\alpha))(sec(\alpha) + tg(\alpha)) = \cos(\alpha)$
6. $(cotg(\alpha) + tg(\alpha))^2 = csc^2(\alpha) + sec^2(\alpha)$

II. Resolver las siguientes ecuaciones trigonométricas, indicando sus soluciones particulares y generales:

1. $2sen(x) - 1 = 0$
2. $2\cos(x) + \sqrt{3} = 0$
3. $sen^2(x) - 1 = 0$
4. $(2\cos(x) + 1)(sen(x) - 2) = 0$
5. $\left(2sen(x) + \sqrt{2}\right)(2\cos(x) - 1) = 0$
6. $\cos(x)\, sen(x) + \cos(x) = 0$
7. $\cos(2x) = \frac{\sqrt{3}}{2}$
8. $2\cos(4x) + 1 = 0$
9. $2sen(5x) = -\sqrt{2}$
10. $tg(x) = \frac{\sqrt{3}}{3}$

11. $sen^2(x) - sen(x) - 2 = 0$

12. $csc^2(x) = 4$

SOLUCIONES ECUACIONES:

1	$x_1 = 30°$ $x_2 = 150°$ $Sg = \left\{ \begin{matrix} 30° + 360° k \\ 150° + 360° k \end{matrix} ; k \in \mathbb{Z} \right\}$
2	$x_1 = 150°$ $x_2 = 210°$ $Sg = \left\{ \begin{matrix} 150° + 360° k \\ 210° + 360° k \end{matrix} ; k \in \mathbb{Z} \right\}$
3	$x_1 = 90°$ $x_2 = 270°$ $Sg = \left\{ \begin{matrix} 90° + 360° k \\ 270° + 360° k \end{matrix} ; k \in \mathbb{Z} \right\}$
7	$x_1 = 15°$ $x_2 = 195°$ $x_3 = 165°$ $x_4 = 345°$ $Sg = \left\{ \begin{matrix} 15° + 180° k \\ 165° + 180° k \end{matrix} ; k \in \mathbb{Z} \right\}$
8	$x_1 = 30°$ $x_2 = 120°$ $x_3 = 210°$ $x_4 = 300°$ $x_5 = 60°$ $x_6 = 150°$ $x_7 = 240°$ $x_8 = 330°$ $Sg = \left\{ \begin{matrix} 30° + 90° k \\ 60° + 90° k \end{matrix} ; k \in \mathbb{Z} \right\}$
9	$x_1 = 45°$ $x_2 = 117°$ $x_3 = 189°$ $x_4 = 261°$ $x_5 = 333°$ $x_6 = 63°$ $x_7 = 135°$ $x_8 = 207°$ $x_9 = 279°$ $x_{10} = 351°$ $Sg = \left\{ \begin{matrix} 45° + 72° k \\ 63° + 72° k \end{matrix} ; k \in \mathbb{Z} \right\}$

4	$x_1 = 120°$ $x_2 = 240°$ $Sg = \left\{ \begin{matrix} 120° + 360° k \\ 240° + 360° k \end{matrix} ; k \in \mathbb{Z} \right\}$	**10**	$x_1 = 30°$ $x_2 = 210°$ $Sg = \left\{ \begin{matrix} 30° + 360° k \\ 210° + 360° k \end{matrix} ; k \in \mathbb{Z} \right\}$
5	$x_1 = 225°$ $x_2 = 315°$ $x_3 = 60°$ $x_4 = 300°$ $Sg = \left\{ \begin{matrix} 225° + 360° k \\ 315° + 360° k \\ 60° + 360° k \\ 300° + 360° k \end{matrix} ; k \in \mathbb{Z} \right\}$	**11**	$x_1 = 270°$ $Sg = \{270° + 360k ; k \in \mathbb{Z}\}$
6	$x_1 = 90°$ $x_2 = 270°$ $Sg = \left\{ \begin{matrix} 90° + 360° k \\ 270° + 360° k \end{matrix} ; k \in \mathbb{Z} \right\}$	**12**	$x_1 = 30°$ $x_2 = 150°$ $x_3 = 210°$ $x_4 = 330°$ $Sg = \left\{ \begin{matrix} 30° + 360° k \\ 150° + 360° k \\ 210° + 360° k \\ 330° + 360° k \end{matrix} ; k \in \mathbb{Z} \right\}$