1 Lista 13 - Exercícios

1.1 Exercícios: Identidades Trigonométricas

1. Prove para todo $x \in \mathbb{R}$, $x \neq k\pi/2$ que valem as seguintes relações:

   (a) $cotan(x) = \dfrac{1}{tan(x)}$

   (b) $tan^2(x) + 1 = sec^2(x)$

   (c) $1 + cotan^2(x) = cossec^2(x)$

   (d) $cos^2(x) = \dfrac{1}{1 + tan^2(x)}$

   (e) $sin^2(x) = \dfrac{tan^2(x)}{1 + tan^2(x)}$

2. Prove

   (a) $tan(x) + cotan(x) = sec(x) \cdot cossec(x)$

   (b) $(tan(x) + cotan(x))(sec(x) - cos(x))(cossec(x) - sin(x)) = 1$

   (c) $sec^2(x) + cossec^2(x) = sec^2(x) \cdot cossec^2(x)$

   (d) $\dfrac{cotan^2(x)}{1 + cotan^2(x)} = cos^2(x)$

   (e) $\dfrac{sin^3(x) - cos^3(x)}{sin(x) - cos(x)} = 1 + sin(x) \cdot cos(x)$

   (f) $cossec^2(x) + tan^2(x) = sec^2(x) + cotan^2(x)$

   (g) $2(sin(x) + tan(x))(cos(x) + cotan(x)) = (1 + sin(x) + cos(x))^2$

   (h) $\dfrac{1 - cos(x)}{1 + cos(x)} = (cossec(x) - cotan(x))^2$

   (i) $\dfrac{cos(x) + cotan(x)}{tan(x) + sec(x)} = cos(x) \cdot cotan(x)$