prove : tan (x) + sec (x) = cos (x) / 1 - sin (x)

By definition, the tangent (tan) of an angle is the ratio of the sine to the cosine:

$$\tan(x) = \frac{\sin(x)}{\cos(x)}$$

and the reciprocal function secant (sec) is the reciprocal of the cosine:

$$\sec(x) = \frac{1}{\cos(x)}$$

Therefore:

$$\tan(x) + \sec(x) = \frac{\sin(x)}{\cos(x)} + \frac{1}{\cos(x)} = \frac{\sin(x)+1}{\cos(x)}$$

multiply by $1 = \frac{1-\sin(x)}{1-\sin(x)}$:

$$\frac{(\sin(x)+1)(}{\cos(x)}\frac{1-\sin(x))}{(1-\sin(x))} = \frac{1-\sin^2(x)}{\cos(x)(1-\sin(x))}$$

The basic relationship between the sine and the cosine is the Pythagorean trigonometric identity:

$\cos^2(x) + \sin^2(x) = 1$ => $1 - \sin^2(x) = \cos^2(x)$

Therefore:

$$\tan(x) + \sec(x) = \frac{\cos^2(x)}{\cos(x)(1-\sin(x))} = \frac{\cos(x)}{1-\sin(x)}$$