c) $\dfrac{\sec\theta}{\sec^2\theta - 1} = \cot\theta\csc\theta$

$\dfrac{\sec\theta}{\tan^2\theta} =$

$\sec\theta \cdot \cot^2\theta =$

$\dfrac{1}{\cos\theta} \cdot \dfrac{\cos^2\theta}{\sin^2\theta} =$

$\dfrac{\cos\theta}{\sin^2\theta} =$ (4)

$\dfrac{\cos\theta}{\sin\theta} \cdot \dfrac{1}{\sin\theta} =$ (5)

I used the right-side expression to help me figure out how go from step (4) to step (5).

$\cot\theta \cdot \csc\theta = \cot\theta \cdot \csc\theta$

Q ED

d) $\dfrac{\sin\theta}{1 - \cos\theta} = \csc\theta + \cot\theta$

$\dfrac{(1+\cos\theta)}{(1+\cos\theta)} \cdot \dfrac{\sin\theta}{(1-\cos\theta)} =$ (multiply by the conjugate of the denominator.)

$\dfrac{\sin\theta + \cos\theta\sin\theta}{1 - \cos^2\theta} =$

$\dfrac{\sin\theta + \cos\theta\sin\theta}{\sin^2\theta} =$ Keeping an eye on the right-side expression, separate this into two fractions.

$\dfrac{\sin\theta}{\sin^2\theta} + \dfrac{\cos\theta \cdot \sin\theta}{\sin^2\theta} =$

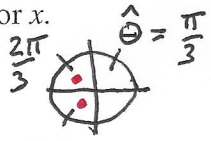
$\dfrac{1}{\sin\theta} + \dfrac{\cos\theta}{\sin\theta} =$

$\csc\theta + \cot\theta = \csc\theta + \cot\theta$

Q ED

5. Find all radian solutions for x.

a) $\sec x = -2$

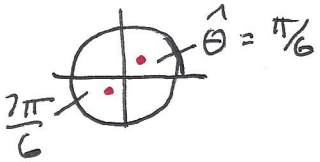


$x = \frac{2\pi}{3} + 2\pi k$

$x = \frac{4\pi}{3} + 2\pi k$

$k \in J$

b) $\cot x = \sqrt{3}$



$x = \frac{\pi}{6} + 2\pi k$

$x = \frac{7\pi}{6} + 2\pi k$

OR, better still

$x = \frac{\pi}{6} + \pi k, \; k \in J$

6. Find all degree solutions for θ.

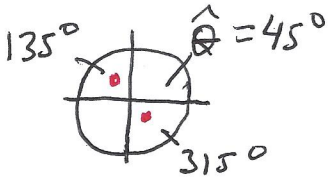
a) $\csc\theta = \sqrt{2}$

$\theta = 45° + 360°k$

$\theta = 135° + 360°k$

$k \in J$

b) $\tan\theta = -1$



$\theta = 135° + 360°k$

$\theta = 315° + 360°k$

Or better still

$\theta = 135° + 180°k, \; k \in J$