1. When we began discussing the trigonometric functions, we gave a precise definition of the function \( \cos \) on the domain \([0, \pi]\). State that definition.\(^1\)

2. From the angle-summation formulae (together with the basic Phytagorean identity connecting \( \sin \) and \( \cos \)), other useful formulae can be deduced.

   (a) Verify that\(^2\)
   \[
   \cos^2 \theta = \frac{1 + \cos 2\theta}{2}
   \]

   (b) Verify that\(^3\)
   \[
   \tan\left(\frac{t}{2}\right) = \frac{\sin t}{1 + \cos t}.
   \]

---

\(^1\)You don’t need to argue that it is a meaningful definition.

\(^2\)There’s also \(\sin^2 \theta = \frac{1 - \cos 2\theta}{2}\), which is worth remembering.

\(^3\)This also equals \(\frac{1 - \cos t}{\sin t}\).