$2\sqrt{3}\sin^2(x/2) + 2 = 2\sin^2(x) + \sqrt{3}$

$2\sqrt{3}(1-\cos x)/2 + 2 = 2\sin^2(x) + \sqrt{3}$

$2\sqrt{3}(1-\cos x)/2 + 2 = 2(1-\cos^2 x) + \sqrt{3}$

$\cos x = t$

$2\sqrt{3}(1-t)/2 + 2 = 2(1-t^2) + \sqrt{3}$

$\sqrt{3} - \sqrt{3}t + 2 - 2 + 2t^2 - \sqrt{3} = 0$

$2t^2 - \sqrt{3}t = 0$

$t(2t - \sqrt{3}) = 0$

$t_1 = \sqrt{3}/2$

$t_2 = 0$

$\cos x = 0$

$x = p/2 + pk$

$\cos x = \sqrt{3}/2$

$x = +- p/6 + 2pk$