

# Quiz 10 MATH 1540 Fall 2018

Solve on  $[0, 2\pi)$ :

$$2\cos^2(t) + \cos(t) = 1.$$

Soln: Subtract 1 to get

$$2\cos^2(t) + \cos(t) - 1 = 0$$

By quadratic formula:  $a=2, b=1, c=-1$ .

$$\cos(t) = \frac{-1 \pm \sqrt{1^2 - 4(2)(-1)}}{2(2)}$$

$$= \frac{-1 \pm \sqrt{1+8}}{4}$$

$$= \frac{-1 \pm 3}{4}$$

So we have

$$\cos(t) \stackrel{\oplus}{=} \frac{-1+3}{4} = \frac{2}{4} = \frac{1}{2} \xrightarrow{\text{unit circle}} t = \frac{\pi}{3}, \frac{5\pi}{3}$$

and

$$\cos(t) \stackrel{\ominus}{=} \frac{-1-3}{4} = \frac{-4}{4} = -1 \xrightarrow{\text{unit circle}} t = \pi$$