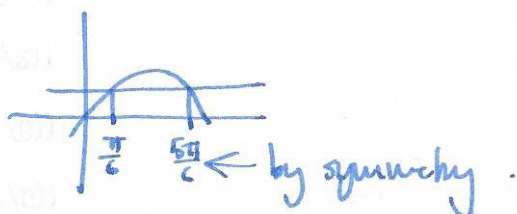
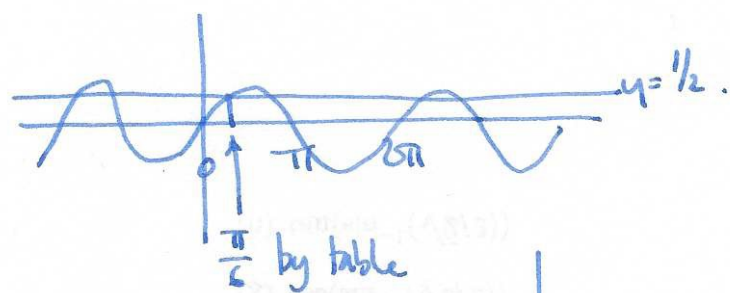


§7.4 Trig equations

Example (exact values) solve $\sin \theta = \frac{1}{2}$



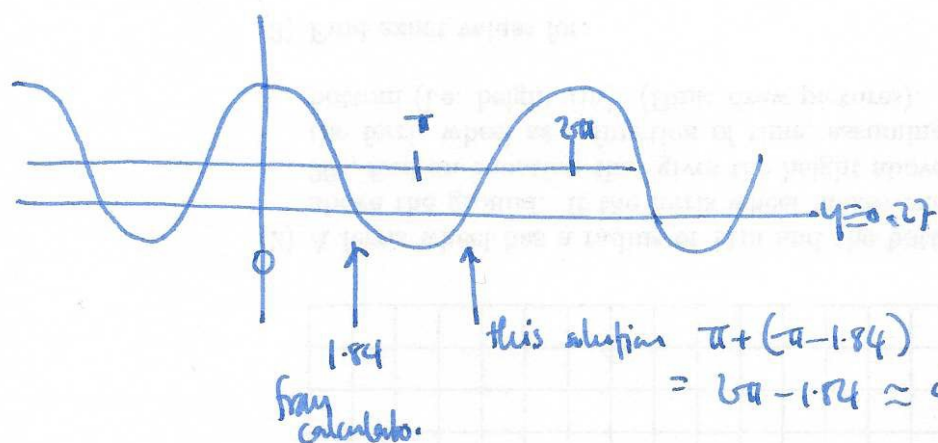
$\sin \theta$ 2π -periodic, so start by finding all solutions in $[0, 2\pi]$

x	0	$\pi/6$	$\pi/4$	$\pi/3$	$\pi/2$
$\sin x$	0	$\sqrt{1}/2$	$\sqrt{2}/2$	$\sqrt{3}/2$	$\sqrt{4}/2$

so all solutions are of the form $\frac{\pi}{6} + 2\pi n, \frac{5\pi}{6} + 2\pi n, n \in \mathbb{Z}$.

Example (decimal approx)

solve $\cos \theta = -0.27$ $\theta = \cos^{-1}(-0.27) = 1.84$



$\cos \theta$ 2π -periodic, so find all solutions in $[0, 2\pi]$.

all solutions:
 $1.84 + 2\pi n$
 $4.44 + 2\pi n, n \in \mathbb{Z}$.

Fancier: solve

$$2\cos^2 \theta - 7\cos \theta + 3 = 0$$

$$(2\cos \theta - 1)(\cos \theta - 3) = 0$$

$$\cos \theta = \frac{1}{2}$$

solve as above.

$$\cos \theta = 3$$

no solutions!

Example solve $\tan^2 2\theta + \tan \theta - 12 = 0$.