Warm Up

(3) An object is moving back and forth along the x-axis, starting at time $t = 0$. Its position after t seconds is $s(t) = t - 2 - 2\cos t$.
(a) What is the acceleration of the object at time t?
(b) What is the first time at which the velocity will be zero?
(For full credit, you should have no trigonometric functions in your answer; for example, if your answer contains $\sin(\frac{\pi}{4})$ you should know that this is $\frac{1}{\sqrt{2}}$.)

(Binghamton University, 2010)

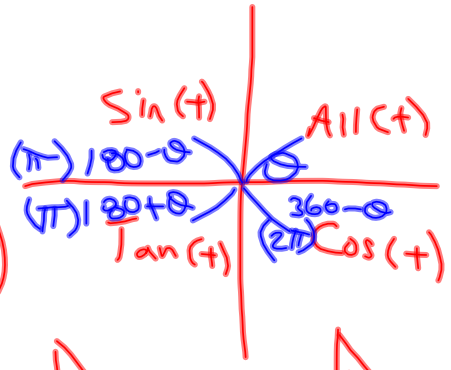
a) $s'(t) = 1 + 2\sin t$

$s''(t) = 2\cos t$ ← acceleration

b) $0 = 1 + 2\sin t$

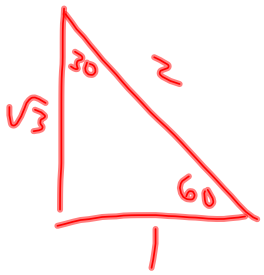
$\sin t = -\frac{1}{2}$

(Q 3 & 4, Ref ∠ $30° \left(\frac{\pi}{6}\right)$)



$t_1 = \frac{\pi}{1} + \frac{\pi}{6}$

$t_1 = \frac{7\pi}{6}$ seconds



$t_2 = \frac{2\pi}{1} - \frac{\pi}{6} = \frac{11\pi}{6}$ seconds

Review Questions...

Page 112 - 114
#1 c, d
#7 b, d
#8 b, d
9 a, b, d, f
#11
#12

Page 115
#1 (ii)
#3
#4
#5

Page 154
#2
#3

equation(s)

BONUS

Find the normals to the curve $xy+2x-y=0$ that are parallel to the line $2x+y=0$.

[4 marks]