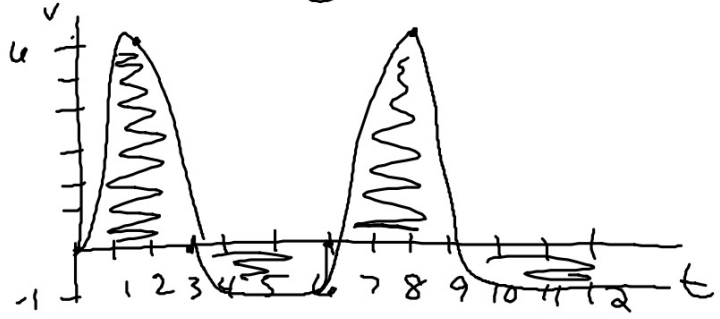
#6 $v(t) = e^{2\sin t} - 1$, $0 \le t \le 12$

a) $a(t) = v'(t) = e^{2\sin t}(2\cos t)$

$v'(1) = 5.82 \text{ ms}^{-2}$

b) i. sketch the graph



ii. $e^{2\sin t} - 1 = 5$ $\ln e^{2\sin t} = \ln 6$

$t = 1.11, 2.03, 7.39, 8.31$ $2\sin t = \ln 6$

$\sin t = \frac{\ln 6}{2} \Rightarrow t = \sin^{-1}\left(\frac{\ln 6}{2}\right)$

$t \approx$

c) $\int_0^{12} \left| e^{2\sin t} - 1 \right| dt \approx 24.1 \text{ m}$