Start here for Question Number: 8

a) $\frac{dP}{dt} = kP$

$\int kP \, dP$

$= kP^2$

b) P(both coins land showing tails) $= 1 - 0.36$

$= 0.64$

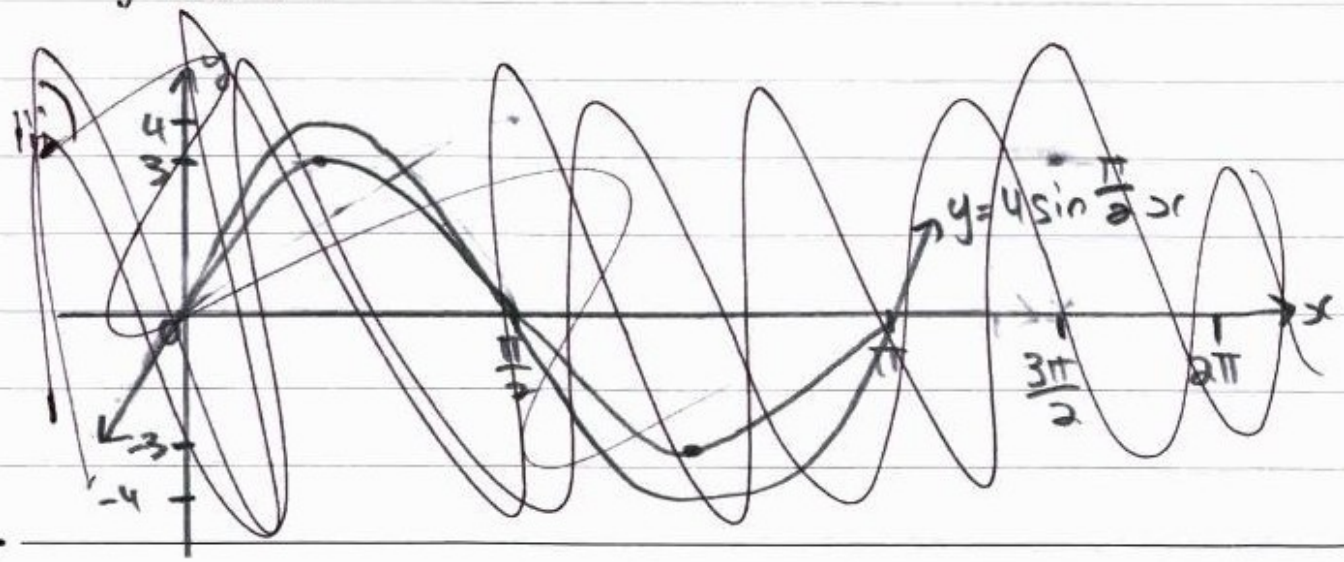
c) i) $A = 4$

$y = 4 \sin bx$

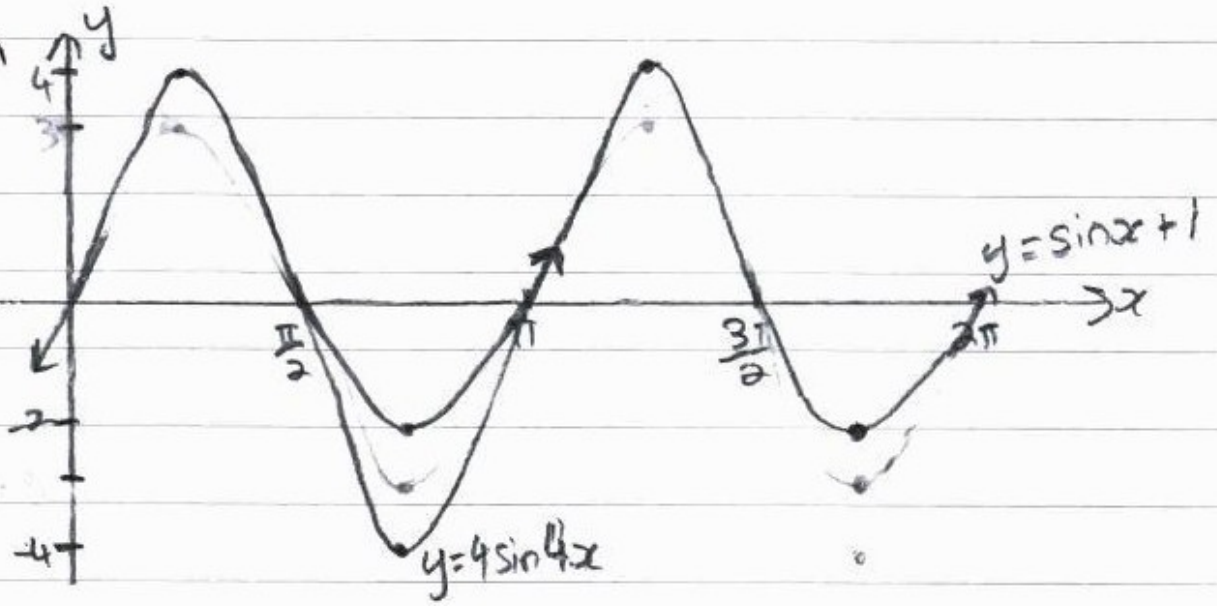
ii) $b = 4$

$\frac{2\pi}{n} = \frac{\pi}{2}$ $\quad 4\pi = n\pi$ $\quad \frac{4\pi}{\pi} = n$ $\quad n = 4$

$y = 4 \sin 4x$



ii)



d) $f(x)=x^3-3x^2+kx+8$

$f'(x)=3x^2-3x+k$

$f''(x)>6x-3$

$0>6x-3$

$3>6x$

$\frac{1}{2}>x$

$f(x)=x^3-3x^2+kx+8$

$0=\frac{1}{8}-3(\frac{1}{2})^2+k(\frac{1}{2})+8$

$=\frac{1}{8}+2\cdot25+\frac{1}{2}k+8$

$=10\cdot375+\frac{1}{2}k$

$-10\cdot375=\frac{1}{2}k$

$k=-20\cdot75$ where $f(x)$ is an increasing function.

Additional writing space on back page.