Work sheet 14

1) Let A, B, C, D be numbers, and $A \neq 0$, $B \neq 0$.
Find the period and amplitude of $y = A\sin(Bx + C) + D$
in terms of A, B, C, D.

2) a) Use the addition theorem to write $\sin(x + \frac{2\pi}{3})$
in the form $a\sin(x) + b\cos(x)$, for some numbers
a and b

b) Write $\frac{\sqrt{3}}{2}\sin(x) + \frac{3}{2}\cos(x)$ in the form $A\sin(x+\phi)$,
for A some number and $\phi \in [-\pi/2, \pi/2]$
(Hint: Use addition theorem on $A\sin(x+\phi)$ and compare coefficients)

c) (Bonus Question) Write $a\sin(x) + b\cos(x)$ in the
form $A\sin(x+\phi)$, where a and b are numbers
such that $a^2 + b^2 \neq 0$

3) a) Use the double angle formulae for sine and cosine
to write $\sin^2(x)\cos^2(x)$ in the form $A\cos(Bx) + C$
for some numbers A, B and C

b) Sketch the graph of $\sin^2(x)\cos^2(x)$.