1 Time evolution of wavefunction in box potential

a) $|\psi|^2 = C^2(2^2 + 3^2 + 1)\frac{a}{2} = 7a = 1, C = \frac{1}{\sqrt{7a}}$
b) $c_1 = 2C\sqrt{\frac{2}{a}}\frac{a}{2} = 2C\sqrt{\frac{a}{2}}, c_2 = 3C\sqrt{\frac{a}{2}}, c_3 = C\sqrt{\frac{a}{2}}$
$S = 14C^2a/2 = 14/7aa/2 = 1$
c)$\psi(t) = C(2\sin(kx)e^{-iE_2t/\hbar} + 3\sin(2kx)e^{-iE_2t/\hbar} + \sin(3kx)e^{-iE_3t/\hbar})$
d) Yes
e) 4:9:1 (/14)
f) No
g) Particle's energy not known prior to measurement.

2 Diabatic (sudden) expansion of infinite box

Griffiths