1. If the origin is on the wall at the midpoint between the slits, the condition is that $\sqrt{(z+d/2)^2+\ell^2}-\sqrt{(z-d/2)^2+\ell^2} = (2m+1)\lambda/2$ for integers m
2. If the origin is on the wall at the midpoint between the slits, the condition is that $\sqrt{(z+d\cos(\theta)/2)^2+(\ell-d/2\sin(\theta)/2)^2}-\sqrt{(z-d\cos(\theta)/2)^2+(\ell+d/2\sin(\theta)/2)^2} = (2m+1)\lambda/2$ for integers m
3. If the origin is on the wall at the midpoint between the slits, the condition is that $\sqrt{(z+d/2)^2+\ell^2}-\sqrt{(z-d/2)^2+\ell^2} = (2m+1/2)\lambda/2$ for integers m
4. $\lambda = \lambda_0/n$, so there will be constructive interference when $\phi = 2\pi(2d/\lambda) = 2m\pi$, or when $\lambda_0 = 2nd/m$ for integers m
5. Here $\phi = 2\pi(2d/\lambda)+\pi = 2m\pi$ is the condition for constructive interference, or $\lambda_0 = 2nd/(m-1/2)$
6. 1.2554×10^{-10} [m]
7. $a\sin(\theta) = m\lambda$, so $a = 3\cdot6\times10^{-7}/\sin(30^\circ) = 3.6\times10^{-6}$ [m]
8. No. We still have $d\sin(\theta) = m\lambda$.
9. We have $\theta_i = \sin^{-1}(z_i\lambda/d) = \sin^{-1}(z_i/5)$ which is $\theta_1 = 14.1^\circ$, $\theta_2 = 26.5^\circ$, $\theta_3 = 40.4^\circ$, $\theta_4 = 58.0^\circ$, and there is no θ_5, since $z_5\lambda/d > 1$.
10. (c)