1. (a) The only singularity is at $z = 3$, so the integrand is analytic on and inside $C$.
   (b) The integrand is entire.
   (c) The singularities of $f$ are at $-1 \pm i$, both of which are outside the unit circle.
   (d) $\text{sech } z = \frac{1}{\cosh z}$, so the singularities are at the zeros of $\cosh z$. These are at $\frac{\pi}{2} i + n\pi i$, all of which are outside the unit circle.
   (e) The singularities of $\tan z$ are at $\frac{\pi}{2} + n\pi$, all of which are outside the unit circle.
   (f) $\log (z+2)$ has a branch point at $z = -2$ and the branch cut is to the left of that. Thus $\log (z+2)$ is analytic on and inside $C$.

2. (a) The singularities are at $z = \pm \frac{1}{3} i$, both of which lie inside the square. Thus $f$ is analytic between the two curves.
   (b) The singularities are at $2k\pi$, none of which occur between the two curves.
   (c) The singularities are at $e^z = 1$, which occurs for $z = 0, 2k\pi i$. Again, none of these lie between the two curves.