Math 326, Worksheet 6

Each of the following functions is the complex potential of some flow field. For each function:

- Compute the vector field. Write it in the form $p + iq$. You can use polar input if it seems appropriate.
- Sketch a potential map. That is, draw several equipotential curves and label each one with the constant potential. Use dashed lines or a light color.
- On the same diagram, sketch several streamlines. Use solid lines or a darker color. Include arrows for direction of flow (up hill in this case).

1. $f(z) = -i \log z$.
2. $f(z) = z^3$, with domain $\{re^{i\theta} : 0 \leq \theta \leq \pi/3\}$.
3. $f(z) = i \text{ arctan } z$.
4. $f(z) = \cos z$, with domain $\{x + iy : 0 \leq x \leq \pi, 0 \leq y\}$.