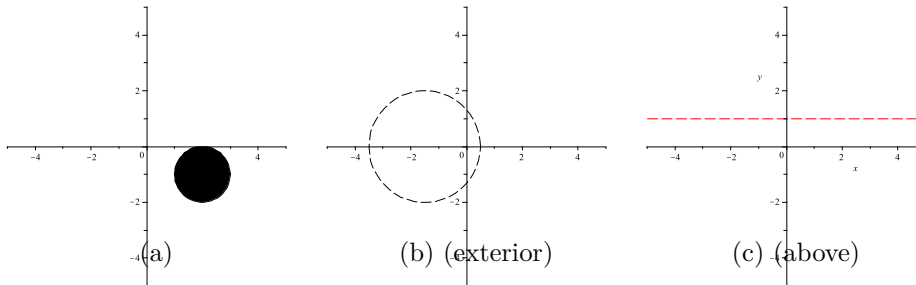


Solutions to Homework Assignment 6

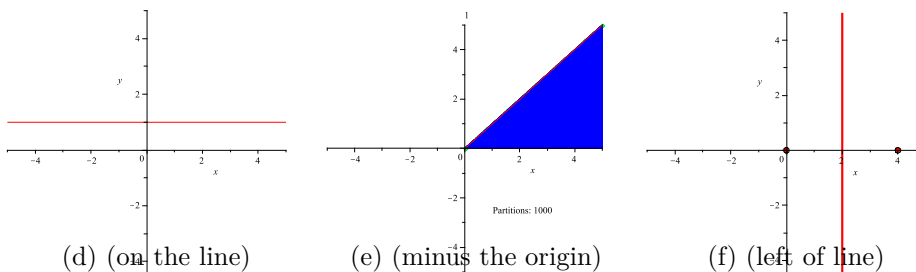
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1,2,3,4,7



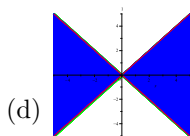
1.



Note that in (f), $|z - 4| = |z|$ on the vertical line. To satisfy the inequality, we need to be to the left of the line.

Only (b) and (c) are open, and both are connected. Thus those are both domains.

2. The region in (e) is almost closed, but it's missing the origin. Since it contains other boundary points, it is also not open.
3. Only (a) is bounded.
4. (a) The closure is the whole complex plane.
 (b) The closure is the whole plane. (All that is missing from the given set is the real axis.)
 (c) After some algebra, this inequality comes out as $(x - 1)^2 + y^2 \geq 1$. This is the exterior of a circle of radius 1 centered at $(1, 0)$ along with the circle itself. It is already closed.



7. (a) The points in this set are just $1, i, -1, -i$, so there are no accumulation points.
 (b) These points spiral in around the origin; the only accumulation point is 0.
 (c) The accumulation points are those satisfying $0 \leq \arg z \leq \pi/2$ along with $z = 0$.
 (d) These points oscillate between being very close to $1 + i$ and very close to $-1 - i$. Those are thus both accumulation points.