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MA 425/525
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Homework 2

Due September 6th on paper at the beginning of class. Justify your answers. Please let me know if you have a question or find a mistake. The book is `https://archive.org/details/complex-variables-2ed-dover-1999-fisher/page/n23/mode/2up`.

- From Section 1.3 (page 28), numbers 1, 2, 3, 7, 8. Also sketch the set in each case. For these problems you do not have to justify your answers.
- From Section 1.4 (page 41), numbers 10 and 19 (for 19 also sketch the set of points of continuity).
- Nonbook problems. Let $f(z) = \frac{z-1}{z+1}$ and $g(z) = z^2$.
  1. Find the range of f on $\{z : z \neq -1\}$.
  2. Show that the range of f on the half plane $\{z : \operatorname{Re} z > 0\}$ is the disk $\{z : |z| < 1\}$.
  3. Find the range of g on the quadrant $\{z : \operatorname{Re} z < 0 \text{ and } \operatorname{Im} z > 0\}$. Sketch the range.

  Hint: For f look at the examples on page 31. For g use polar form.