1. Textbook 4.12. Use the principal value of $z^{1/2}$.

2. Textbook 4.15. We've done parts of this exercise here and there, but it's an important result and worth doing again in this more general form.

3. Textbook 4.22.

4. Textbook 4.25 (you may assume the result of exercise of 4.23)

5. Textbook 4.27. It is implicit in the problem statement that $r \neq |a|$.

6. Textbook 4.35.