*Solve 2.3: 2 b

*Solve 2.3: 5a,c; in 5c use bipolar coordinate angles (as defined in problem 5b):
\[ z + 1 = r_1 e^{i\theta_1}, z - 1 = r_2 e^{i\theta_2} \]
where \( 0 \leq \theta_j < 2\pi, j = 1, 2 \) so that there is a branch cut on the
\( x \)-axis: \(-1 \leq x \leq 1\)

*Solve: From the basic definition of complex integration in section 2.4, evaluate the
integral \( \oint_C f(z)dz \) where \( C \) is the parameterized unit circle enclosing the origin,
\( C: x(t) = \cos t, y(t) = \sin t \) where \( f(z) \) is given by:

a) \( z/\bar{z} \)

b) \( (2z - 1)/z^2 \)

*Let \( C \) be a square with diagonal corners at the origin and at \( 1 + i \). From the basic
definition of complex integration in section 2.4, evaluate \( \oint_C f(z)dz \) where \( f(z) \) is given by:

a) \( z \)

b) \( \bar{z} \)

*Solve 2.4: 7

*Evaluate the integral \( \oint_C f(z)dz \) where \( C \) is the unit circle (centered at the origin) where
\( f(z) \) is given by:

a) \( e^{2iz} \)

b) \( (z^2 + 1)/z^3 \)

You can use Cauchy’s Theorem and, if useful, deformation of the contour.

*Solve (XC) 2.5: 6