Math 427 Autumn 2019

Homework 7 **Due Friday, December 6**

Section 3.4: 12, 13, 14, 15, 16

Additional problems:

1. Find the partial fraction decomposition of $(z^3 - 1)^{-1}$; that is, find a, b, c so that

$$\frac{1}{z^3 - 1} = \frac{a}{z - 1} + \frac{b}{z - e^{2\pi i/3}} + \frac{c}{z - e^{4\pi i/3}}$$

2. Suppose that $f(z)$ has a pole of order 2 at z_0. Show that a_{-2} in the expansion $f(z) = \sum_{k=-2}^{\infty} a_k (z - z_0)^k$ can be obtained by

$$a_{-2} = \lim_{z \to z_0} (z - z_0)^2 f(z)$$

Use this to find a_{-2} at $z_0 = 0$ for $f(z) = (1 - \cos z)^{-1}$.