PROJECT III - MATH 800
DUE MARCH 27, 2018

(1) Problem 2/page 145;

(2) Problem 5 b), c), f) /page 145;

(3) Problem 8 a)/page 146;
  Hint: Consider $g(z) = f(z)(z - P)$, defined for $D(P, r) \setminus \{P\}$. Write its Taylor series (why does it exists?) and argue from there.

(4) Problem 9/page 146;
  Hint: Show first that what they ask follows from: If f has essential singularity at P, then for every n
  $$\limsup_{z \to P} |(z - P)^n f(z)| = \infty.$$
  Then, work to show this last formulation by contradiction.

(5) Problem 13 b), c), e)/page 147;

(6) Problem 14/page 147;
  Hint: Answer is no. Try the sequence of partial sums of a Laurent series at a essential singularity like $e^{1/z}$.

(7) Problem 25/page 149;
  Hint: Argue by looking at the Laurent expansion.

(8) Problem 38/page 152.