Answer all questions. Make sure that you explain all your steps and justify your answers.

32. (a) [4pts] Do Prob. 1 of section 5.5, p. 276 of textbook.
   (b) [3pts] Do Prob. 2 of section 5.5, p. 276 of textbook.
   (c) [3pts] Do Prob. 3 of section 5.5, p. 276 of textbook.

33. (a) [5pts] Do Prob. 4 of section 5.5, p. 276 of textbook.
   (b) [5pts] Do Prob. 6 of section 5.5, p. 276 of textbook.

34. (a) [4pts] Do Prob. 10 of section 5.5, p. 276 of textbook.
   (b) [6pts] Obtain 3 (nonzero) terms of the Laurent series at $z_0 = 0$ for the following functions.
      (i) $\cos(1/z) z^2 + 1$ for $|z| > 1$; (ii) $\frac{1}{\sin z}$ for $0 < |z| < \pi$; (iii) $\frac{1}{\cosh z - 1}$ for $0 < |z| < 2\pi$.

35. (10pts) Find and classify all singularities of the following functions.
   (i) $\frac{z^4 - 16}{z^2(z+2)}$; (ii) $z^5 \sin(1/z)$; (iii) $(\sin z - 1)^{-1}$; (iv) $\frac{\sinh(2z)}{z^3} - \frac{1}{2}$; (v) $\tan(1/z^2)$.

36. (a) [3pts] Do Prob. 2 of section 5.6, p. 285 of textbook.
   (b) [4pts] Do Prob. 8 of section 5.6, p. 286 of textbook.
   (c) [3pts] Do Prob. 19 of section 5.6, p. 287 of textbook.

37. (a) [6pts] Classify the behavior at $\infty$ for each of the following functions. (If $\infty$ is a zero or pole, specify its order).
      (i) $\frac{z^2 + 2}{z^2}$; (ii) $\frac{z^2 - 1}{z}$; (iii) $e^{\cot(1/z)}$.
   (b) [2pts] Do Prob. 2 of section 5.7, p. 290 of textbook.
   (c) [2pts] Do Prob. 6 of section 5.7, p. 291 of textbook.

38. (a) [7pts] Do Prob. 3 of section 6.1, p. 313 of textbook.
   (b) [3pts] Do Prob. 6 of section 6.1, p. 314 of textbook.

   (b) [2pts] Do Prob. 4 of section 6.2, p. 317 of textbook.
   (c) [2pts] Do Prob. 6 of section 6.2, p. 317 of textbook.
   (d) [4pts] Do Prob. 10 of section 6.2, p. 318 of textbook.