Review Sheet for Final Exam

These are some review problems which you may study in addition to homework problems and quiz problems. This is not to be considered a comprehensive list of what will be on the exam. Other sources of practice exercises include p. 88,p.547, p.634, p. 682, and p. 840. You will not need to know material which we have not covered, such as hyperbolic sine, etc. Good luck!

page	problem number
406	21,35
493	45,65
500	55,59,69,73
531	91,103,111
558	35,41,45,51,55,61,69,81
568	23,29
579	15,19,27,33,39
585	13,21,31,37
591	27,35
631	33,63
648	17,21,23
657	13,21
664	1 (just the first term)
757	21,83
769	13,21,39,43,49,57
775	29
781	35
786	25,37,43
792	9,43,47
804	31,37
810	7,19,27
819	17,29,37
831	9,13,31,55
838	7,13

1. Let $a = 1 + i, \quad b = 1 - 2i$.

   (a) Find a in polar coordinates.

   (b) Find $a + b$, $a - b$, ab, and a/b in rectangular coordinates.

   (c) Find $\overline{a}$ in polar coordinates.

   (d) Find $\overline{a} + \overline{b}$, $\overline{a - b}$, $\overline{ab}$, and $\overline{a/b}$ in rectangular coordinates.

2. Let $\Re z$ denote the real part of z and $\Im z$ the imaginary part.

   (a) Show that

   $$\Re z = \frac{z + \overline{z}}{2}$$

   and

   $$\Im z = \frac{z - \overline{z}}{2i}.$$

(b) Use part (a) to conclude that

$$\cos z = \frac{e^{iz} + e^{-iz}}{2}$$

and

$$\sin z = \frac{e^{iz} - e^{-iz}}{2i}$$

when z is real.

(c) Use Taylor series to show the same equalities for any complex z.