

Due: Friday 24 Sep. at start of class
except #1 due in WeBWorK Thursday 23 Sep. 5:00 p.m.

For *Mathematica* work, remember:

- print both your input cell(s) and the corresponding output;
 - put printouts in their proper places among the solutions, so that all your work is in the order of the problem list; and
 - you may write on printouts, too, or use Text cells there instead of writing on paper.
1. This question consists of set 421HW2 in *WeBWorK*. The answers to the questions there are due Thursday 23 Sep. 5:00 p.m.
 2. Do page 21, Exercise 6, (b) and (c).
 3. Do page 30, Exercise 7. Also find the set $\arg(z_1)$.
 4. Do page 37, Exercise 2.
 5. Do page 37, Exercise 4.
 6. (a) With paper and pencil calculations, find the 6th roots of unity, each in Cartesian form $a + bi$.
(b) Repeat (a) but using *Mathematica*.
(c) Indicate which one is the *primitive* 6th root of unity, and why.
(d) In *Mathematica*, draw all six of them by using *Presentations*. In your drawing display the points (made big enough to see readily) as well as line segments that “connect the dots” to form a polygon.
 7. Find the 6th roots of $64 + 64i$. Leave your answers as exact expressions and not as numerical approximations.
 8. Do page 38, Exercise 12. [*Hints:* The n th roots of unity are the zeros of the polynomial $z^n - 1$; what, then, does the factor theorem say about $z^n - 1$? Also, what do you get if you multiply $1 + z + z^2 + \cdots + z^{n-1}$ by $z - 1$?