MA341 — Homework #6
Due Wednesday, April 2, in class

1. Find all solutions to $z^4 = -81$. Your answers should be exact, not approximations, and should not be left in the form of sines or cosines. Show your work.

2. Find one solution to $z^3 = 4\sqrt{2} + (4\sqrt{2})i$. Your answer should be exact, not an approximation, and should not be left in the form of sines or cosines. Hint: Use the half-angle formulas somewhere. Show your work.

3. Exercise 7.3.15. Suggestion: You may use the fact that if you are solving a system of the form
$$a_1 x + b_1 y = c_1$$
$$a_2 x + b_2 y = c_2$$
and if $a_1 b_2 - a_2 b_1 \neq 0$, then there exists a solution (x, y) and it is unique.

4. Exercise 7.3.16. See the above suggestion.

5. Suppose $A_1(x_1, y_1, z_1)$ and $A_2(x_2, y_2, z_2)$ are two points on a sphere of radius r centered at $O(0, 0, 0)$. Find a formula for the distance between A_1 and A_2 along an arc of a great circle on the surface of the sphere. Hint: Consider the central angle $\angle A_1 O A_2$ and its cosine.