PRACTICE EXAM 4 - MATH 140 DATE: Tuesday, November 7

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Read each problem very carefully before starting to solve it. Each question is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

- 1. Consider a triangle $\triangle ABC$ with $\alpha = 15^{\circ}, \beta = 30^{\circ}$ and a = 3. Give the length of side b as a numerical expression (in the final answer roots are allowed but not trig functions).
- 2. Use the Law of Cosines to show that in any triangle $\triangle ABC$

$$\frac{\cos\alpha}{a} + \frac{\cos\beta}{b} + \frac{\cos\gamma}{c} = \frac{a^2 + b^2 + c^2}{2abc}$$

- 3. Given a triangle $\triangle ABC$, with $\alpha = 75^{\circ}, b = 4$ and c = 7 give its area as a numerical expression (roots allowed but no trig functions).
- 4. Transform from polar to cartesian coordinates the equation $r = -6 \cos \theta$. Then plot the resulting cartesian equation, clearly depicting all key points.
- 5. Write the complex number z = 1 i in polar form. Then find $(1 i)^{12}$ and put it in the standard form.
- 6. Find the complex cube roots of -8. Put them in the standard form.