Beverly Hills High School -- FST Trig -- Quest #5 -- Spring 2016 -- 75 points

As usual, show all of your work. Partial credit for partial achievement. Be neat, clear and complete. Each question is five points unless specified otherwise. No calculators needed on this page.

1) A pendulum of length 24 inches swings an arc measuring 36π inches at its outer edge. Through what angle did the pendulum swing?

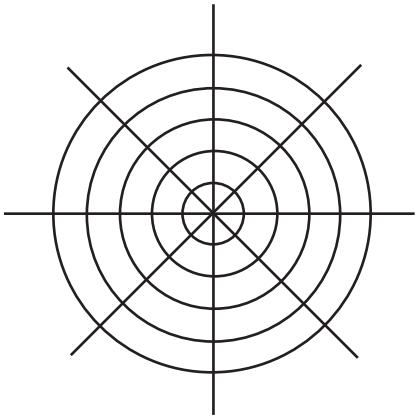
2) Convert these to rectangular coordinates ==> $(12, \frac{\pi}{6})$

3) Convert these to polar coordinates ==> $(\sqrt{2}, \sqrt{6})$

4) One point apiece...graph the following points and label them A thru E on the diagram at right:

A(5, 60°) B(-4, 0°) C(3, -45°)

D(2, $\frac{5\pi}{4}$) E(-3, $\frac{5\pi}{2}$)



For the following problems, let $z_1 = 3 - 2i$, $z_2 = 4 + i$, $z_3 = 5 + 2i$, $z_4 = \sqrt{3} - i$, and $z_5 = 4 + 4\sqrt{3}\,i$

5) $4z_3 - 3z_1 =$

6) $\sqrt{3}\,z_4 + 2z_5 =$

7) $z_2^* =$

8) $\frac{Z_3}{Z_1} =$

9) Ten points on this one. Convert both z_4 and z_5 to trigonometric form. Then find their product. Then find their quotient, $\frac{Z_4}{Z_5}$. No need to calculate values of sines and cosines.

10) State De Moivre's Theorem. Then use it to calculate the standard-form value of $(\sqrt{3} - i)^5$.

11) Find all the roots of $\sqrt[3]{2 + 2i\sqrt{3}}$

Calculators okay on this page.

12) Find the standard-form value of z^6, if $z = 2\sqrt{7} - 5i$ (values accurate to one decimal place)

13) Find all the roots of $\sqrt[6]{Z}$ if z = -4 + 3i. Evaluate all values to one decimal place.

14) Change this into standard form, accurate to one decimal place:

$$z = 3\sqrt{29}\,(\cos 122° + i \sin 122°)$$