



## Module 1 Homework

Quiz, 5 questions

1  
point

1.

Let  $z = 2 - 3i$ . Which of the following are true: (Check all that apply.)

- ☐  $z \cdot \overline{z} + z^2 = 6 - 10i$
- ☐  $|z - 1|^2 = 11$
- ☐  $z^2 + 2z + 1 = -6i$
- ☐  $|z + 2| = 5$

1  
point

2.

Let  $z = -3 + 3i$  and  $w = 2e^{-i\pi/2}$ . Which of the following are true: (Check all that apply.)

- ☐ The Cartesian form of  $z \cdot w$  is  $6 + 6i$ .
- ☐ The polar form of  $z + w$  is  $\sqrt{10}e^{i\pi/5}$ .
- ☐ The polar form of  $\frac{z}{w}$  is  $\frac{3}{\sqrt{2}}e^{-3\pi i/4}$ .
- ☐ The Cartesian form of  $\frac{z}{w}$  is  $\frac{1}{2} - \frac{3}{4}i$ .

1  
point

3.

Which of the following are true: (Check all that apply.)

Note: If you don't remember special values of the sine and cosine functions such as  $\cos(\frac{\pi}{6}) = \frac{\sqrt{3}}{2}$ , if may be helpful to search the internet for such values.

Also note that the principal root of a complex number is the one which you find when using the value  $k = 0$  in our formula, where the argument  $\theta$  of the number whose root we are taking is chosen to be the principal argument, that is the value  $\theta$  for which  $-\pi < \theta \leq \pi$ .

- ☐ The fourth roots of  $-16$  are  $\pm 2(1 + i)$  and  $\pm 2(1 - i)$ .



☐ The principal cubed root (that is, the root you find when using the value  $k = 0$  in our formula) of  $-1$  is  $-1$ .

## Module 1 Homework

Quiz, 5 questions

☐ The principal square root of  $1 - \sqrt{3}i$  is  $\frac{\sqrt{3}-i}{\sqrt{2}}$ .

☐ The fourth roots of  $(-8 - 8\sqrt{3}i)$  are  $\pm(\sqrt{3} - i)$  and  $\pm(1 + \sqrt{3}i)$ .

1  
point

4.

What is true of the set  $E = \{z \in \mathbb{C} : |z + i| = 2|z|\}$ ? (Check all that apply.)

- ☐ The set  $E$  is connected.
- ☐ The set  $E$  is bounded.
- ☐ The set  $E$  is not bounded.
- ☐ The set  $E$  is a circle, centered at  $-i$  and of radius 2.

1  
point

5.

Using deMoivre's formula, verify which of the following are true: (Check all that apply.)

☐  $(2(\cos \frac{\pi}{12} + i \sin \frac{\pi}{12}))^8 = 128 + 128\sqrt{3}i.$

☐  $(\cos \theta + i \sin \theta)^3 = \cos(3\theta) + i \sin(3\theta).$

☐  $(\cos \frac{\pi}{6} + i \sin \frac{\pi}{6})^2 = 1 + \sqrt{3}i.$

☐  $(\sqrt{2}(\cos \frac{\pi}{20} + i \sin \frac{\pi}{20}))^{10} = 32i.$

☐ I, **Madhu Sreedhar**, understand that submitting work that isn't my own may result in permanent failure of this course or deactivation of my Coursera account.

[Learn more about Coursera's Honor Code](#)

Submit Quiz



