Powers of a Complex Number Name _____

1. The graph below shows z , z^2, z^3, z^4, z^5, z^6, z^7, and z^8 where $z = \sqrt{3} + \mathbf{i} \approx \mathbf{1.723051} + \mathbf{i}$

Write the indicated power of **z** in **polar** format.

$z =$ $z^2 =$

$z^3 =$ $z^4 =$

$z^6 =$ $z^8 =$

Write the indicated power of **z** in standard a + bi format.

$z =$

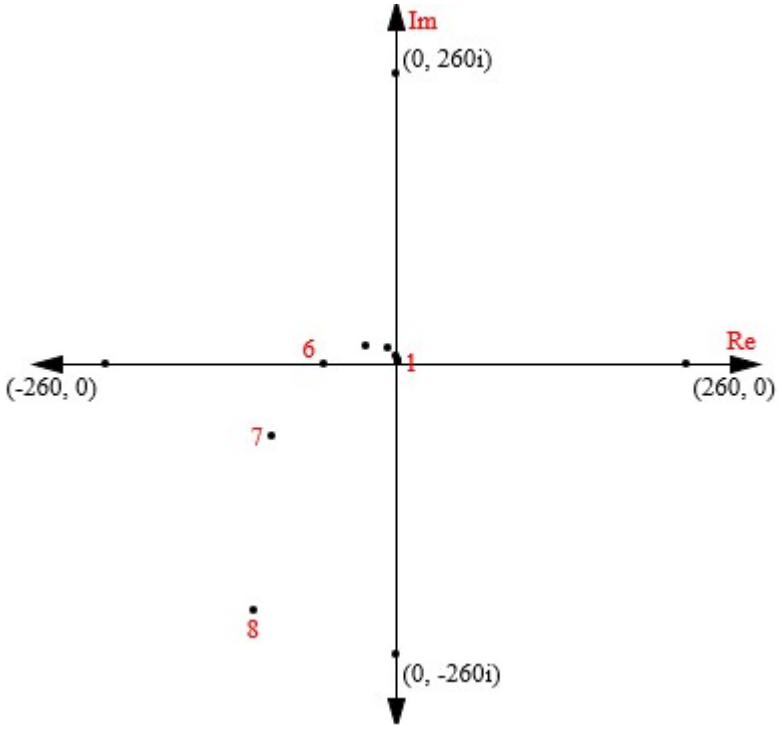
$z^2 =$

$z^3 =$

$z^4 =$

$z^6 =$

$z^8 =$



2. The graph below shows z , z^2, z^3, z^4, z^5 and z^6 where $z = -1 + \mathbf{i}$

Write the indicated power of **z** in **polar** format.

$z =$ $z^2 =$

$z^3 =$ $z^4 =$

$z^5 =$ $z^6 =$

Write the indicated power of **z** in standard a + bi format.

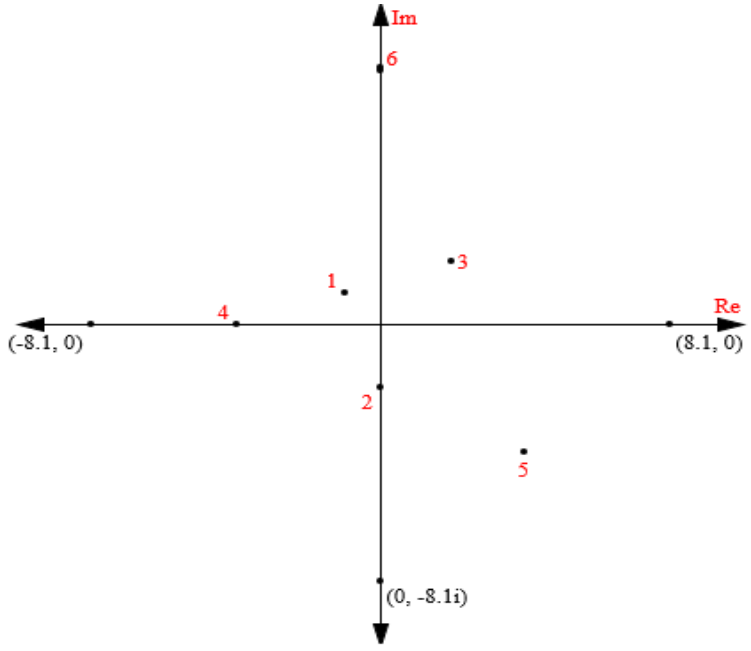
$z =$

$z^2 =$

$z^3 =$

$z^5 =$

$z^6 =$



3. The graph below shows $z, z^2, z^3, z^4, \ldots z^{20}$ where $\mathbf{z} = 0.942024851 + 0.659612902\mathbf{i}$.

a) Write **z** in polar format.

b) Write $\mathbf{z}^6$ in polar format.

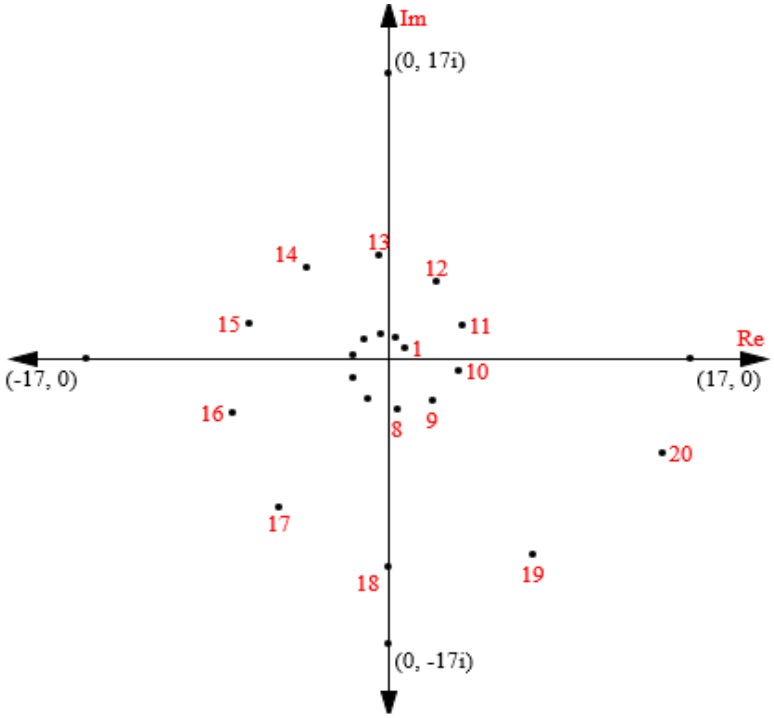
c) Write $\mathbf{z}^6$ in standard a + bi format.

d) Write $\mathbf{z}^{16}$ in polar format.

e) Write $\mathbf{z}^{16}$ in standard a + bi format.

f) Write $\mathbf{z}^{20}$ in polar format.

g) Write $\mathbf{z}^{20}$ in standard a + bi format.



4. The graph below shows $z, z^2, z^3, z^4, \ldots z^{20}$ where $\mathbf{z} = 0.770361619 - 0.359225522\mathbf{i}$.

a) Write **z** in polar format. (Choose negative angle.)

b) Write $\mathbf{z}^7$ in polar format.

c) Write $\mathbf{z}^7$ in standard a + bi format.

d) Write $\mathbf{z}^{12}$ in polar format.

e) Write $\mathbf{z}^{12}$ in standard a + bi format.

f) Write $\mathbf{z}^{20}$ in polar format.

g) Write $\mathbf{z}^{20}$ in standard a + bi format.