

## Advanced Math

6-5

(Day 2)

### DeMoivre's Theorem

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#### DeMoivre's Theorem :

if  $z$  is a complex number and  $n$  is a positive integer, then

$$z^n = r^n [\cos(n\theta) + i \sin(n\theta)]$$

\*1)  $(3 - 7i)^5 =$

#### $n$ th Roots of Complex Numbers :

For a positive integer  $n$ , the complex number  $z = r(\cos\theta + i \sin\theta)$  has exactly  $n$  distinct roots given by

$$\sqrt[n]{r} \left( \cos \frac{\theta + 2\pi k}{n} + i \sin \frac{\theta + 2\pi k}{n} \right)$$

where  $k = 0, 1, 2, \dots, n - 1$

Find the following root:

\*2)  $\sqrt[4]{3-7i}$

Assignment: pg. 563 70-80 even, 89-100 all.
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