1. DeMoivre's Theorem: $(r\ cis\ \theta)^n = r^n cis\ n\theta$ (Take r to the n^{th} power, then n times θ)

2. DeMoivre's Theorem can be used to easily find higher powers of complex numbers.
$(3 + 3\sqrt{3}\,i)^5$ would take a lot of steps if we multiplied the binomial a number of times.
Switch to Trigonometric Form: $r = \sqrt{9+27} = 6$ $\theta = \arctan\frac{3\sqrt{3}}{3} = \arctan\sqrt{3} = \frac{\pi}{3} = 60°$
Using DeMoivre's Theorem, we get $r = 6^5 = 7776$ $5\theta = \frac{5\pi}{3} = 300° \rightarrow 7776 \text{ cis } \frac{5\pi}{3} = 7776 \text{ cis } 300°$.
Convert back to Standard Form: $7776\cos\frac{5\pi}{3} + 7776\sin\frac{5\pi}{3}\,i = (7776)\frac{1}{2} - (7776)\frac{\sqrt{3}}{2}\,i = \boxed{3888 - 3888\sqrt{3}\,i}$

Pre-Calculus 2 Assignment 210 Monday, February 16, 2014 Hour Name

Use DeMoivre's Theorem to find the indicated power of the complex number. Write the result in standard form.

1.	$(1 + i)^3$
2.	$(2 + 2i)^6$
3.	$(-1 + i)^{10}$
4.	$(1 - i)^8$
5.	$2(\sqrt{3} + i)^5$
6.	$4(1 - \sqrt{3}\, i)^3$
7.	$(5 \text{ cis } 20°)^3$
8.	$(3 \text{ cis } 150°)^4$

9. $\left(2 \text{ cis } \frac{\pi}{2}\right)^{12}$	
10. $(2 \text{ cis } \pi)^{8}$	
11. $(\text{cis } 0)^{20}$	
12. $(4 \text{ cis } 10^\circ)^{6}$	
13. $(3 \text{ cis } 15^\circ)^{4}$	
14. $\left(3 \text{ cis } \frac{\pi}{8}\right)^{2}$	
15. $\left[2\left(\cos \frac{\pi}{10} + i \sin \frac{\pi}{10}\right)\right]^{5}$	