

Homework 32 - Complex Numbers

1) Evaluate and write in the form, $a + bi$

a) $(1+3i)(5-i)$

b) $\frac{2+5i}{-3+7i}$

c) $(2i)^3$

d) $\sqrt{-4}\sqrt{-16}$

2) Find all solutions of the equation:

a) $16x^2 + 9 = 0$

b) $2x^2 + x + 1 = 0$

c) $x^2 + \frac{1}{3}x + \frac{1}{9} = 0$

3) Write the number in polar form with argument between 0 and 2π .

a) $-5 + 5i$

b) $2 - 2\sqrt{3}i$

c) $6i$

4) Find polar forms for zw , z/w , and $1/z$ by first putting z and w into polar form.

a) $z = 1 + \sqrt{3}i$, $w = \sqrt{3} + i$

b) $z = 2\sqrt{3} - 2i$, $w = 6i$

5) Find the indicated power using De Moivre's Theorem.

a) $(1+i)^{16}$

b) $(\sqrt{3}-i)^5$

6) Find the indicated roots. Sketch the roots in the complex plane.

a) The fourth roots of 1.

b) The cube roots of $27i$.

c) The cube roots of $\sqrt{2}+\sqrt{2}i$.

7) Write the number in the form $a + bi$.

a) $e^{i\frac{\pi}{4}}$

b) $e^{-i\frac{\pi}{3}}$

c) $e^{4+i\frac{\pi}{2}}$