9-6

NAME _____ DATE _____ PERIOD _____

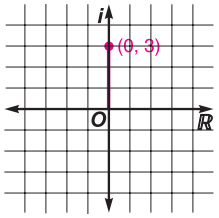
Practice

The Complex Plane and Polar Form of Complex Numbers

Graph each number in the complex plan and find its absolute value.

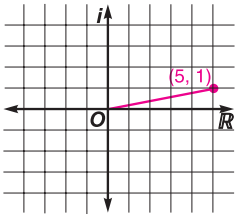
1. $z = 3i$

$|z| = 3$



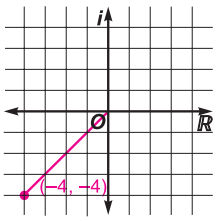
2. $z = 5 + i$

$|z| = \sqrt{26}$



3. $z = -4 - 4i$

$|z| = 4\sqrt{2}$



Express each complex number in polar form.

4. $3 + 4i$

$5(\cos 0.93 + i \sin 0.93)$

5. $-4 + 3i$

$5(\cos 2.5 + i \sin 2.5)$

6. $-1 + i$

$\sqrt{2}\left(\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4}\right)$

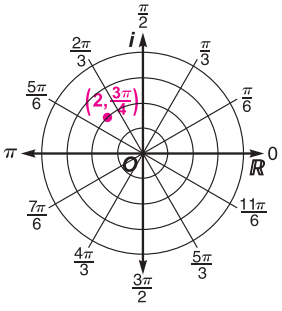
7. $1 - i$

$\sqrt{2}\left(\cos \frac{7\pi}{4} + i \sin \frac{7\pi}{4}\right)$

Graph each complex number. Then express it in rectangular form.

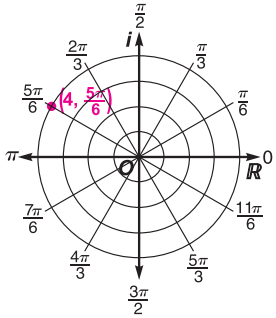
8. $2\left(\cos \frac{3\pi}{4} + i \sin \frac{3\pi}{4}\right)$

$-\sqrt{2} + \sqrt{2}i$



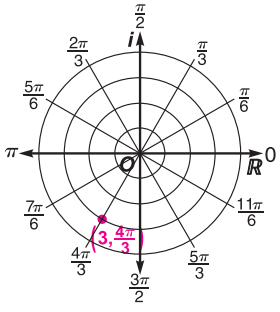
9. $4\left(\cos \frac{5\pi}{6} + i \sin \frac{5\pi}{6}\right)$

$-2\sqrt{3} + 2i$



10. $3\left(\cos \frac{4\pi}{3} + i \sin \frac{4\pi}{3}\right)$

$-\frac{3}{2} - \frac{3\sqrt{3}}{2}i$



11. ***Vectors*** The force on an object is represented by the complex number $8 + 21i$, where the components are measured in pounds. Find the magnitude and direction of the force.

22.47 lb; 69.15°

9-6

NAME

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A Complex Tr

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1. Start at the oak tr
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2. Turn 90° to the rig
stake in the groun
3. Go back to the oak
number of paces.
4. Turn 90° to the lef
stake in the groun
5. Find the spot half
the gold.

Years later, an exper
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general area where t
rock could be found.
located the spring an
trees had sprung up
to know which one w
through prudent app
the gold. Especially

- The distance b
numbers can b
the difference
- Multiplication
number 90° co
rotates it 90° c

The expert drew a m
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location of the oak tr
it by $T(a + bi)$.

1. Find the distance
the distance as a c

$|(a + 1) + bi|$

2. Write the complex
counterclockwise r
where the first sta
3. Repeat Exercises
rock. Where shou
4. The gold is halfwa
the location. (0
axis 1 unit fro