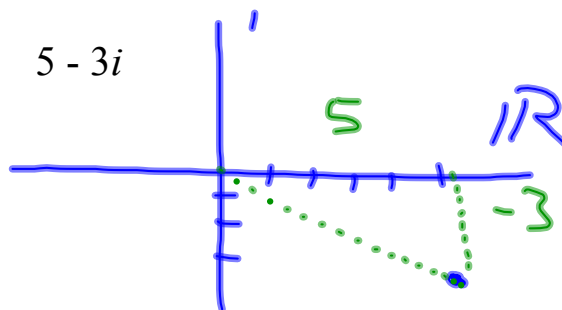


6-5 THE COMPLEX PLANE

Complex number in standard form - $z = a + bi$.

Graph: 5

Find: $|5| = 5$ Graph: $5 - 3i$ Find: $|5 - 3i|$

$$\sqrt{34}$$

Ex 1 Evaluate the following:

$$(5 - 3i) + (2 + 7i)$$

$$(5 - 3i) - (2 + 7i)$$

$$(5 - 3i)(2 + 7i)$$

$$\begin{array}{l} (5 - 3i) \\ (2 - 7i) \end{array} \begin{array}{l} (2 + 7i) \\ (2 + 7i) \end{array}$$

$$(5 - 3i)^{10}$$

$$(5 - 3i)(5 - 3i) \dots$$

$$10 + 35i - 6i - 21i^2$$

$$31 + 29i$$

Trigonometric (Polar) form of $z = a + bi$

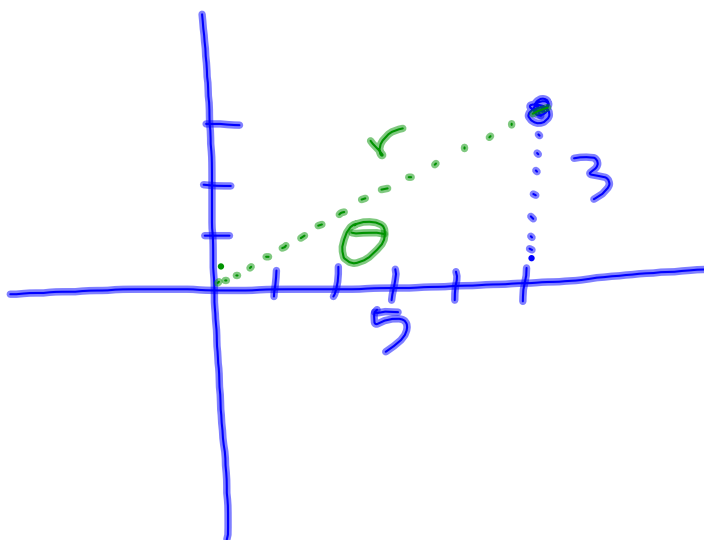
$$z = r(\cos\theta + i \sin\theta)$$

$$r = \sqrt{a^2 + b^2}$$

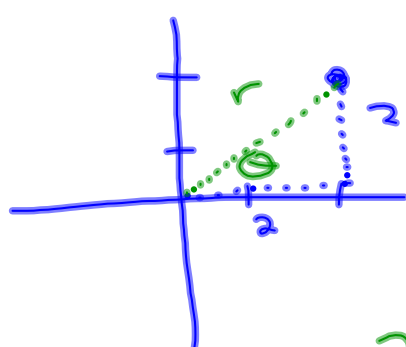
$$\tan\theta = \frac{b}{a}$$

$$a = r \cos\theta$$

$$b = r \sin\theta$$



Ex 2 Find the trigonometric (polar) form of $2 + 2i$



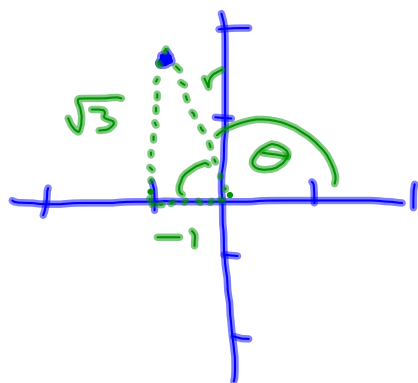
$$r = 2\sqrt{2}$$

$$\theta = 45^\circ$$

$$z = r(\cos\theta + i \sin\theta)$$

$$z = 2\sqrt{2}(\cos 45^\circ + i \sin 45^\circ)$$

Ex 3 Find the trigonometric (polar) form of $-1 + \sqrt{3}i$



$$z = 2(\cos 120^\circ + i \sin 120^\circ)$$

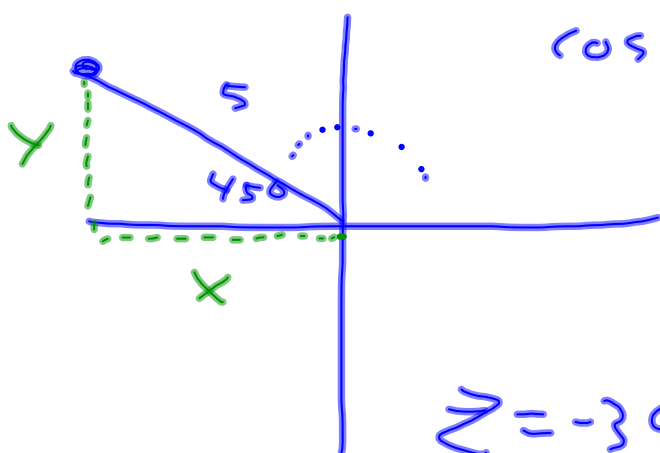
$$r = 2$$

$$\tan \theta = \frac{\sqrt{3}}{-1}$$

$$\theta = 120^\circ$$

Ex 4 Write the complex number in standard form.

$$5(\cos 135^\circ + i \sin 135^\circ)$$



$$\cos 45^\circ = \frac{x}{5}$$

$$x \approx -3.5$$

$$y \approx 3.5$$

$$z = -3.5 + 3.5i$$

Ex 5 Write the complex number in standard form.

$$4(\cos 60^\circ + i \sin 60^\circ)$$

$$2 + 3.5i$$

Homework
p.456
#1-39 odds