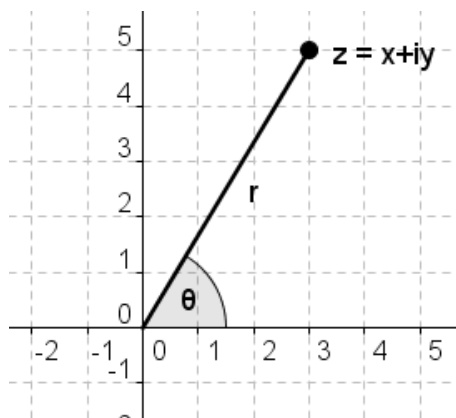


Student Activity: To examine complex numbers in polar form

Use in connection with the interactive file, 'Complex Numbers Polar Form', on the Student's CD.

1.



- a. Using the above diagram write x in terms of the modulus r and the argument θ of the complex number z .

- b. Using the above diagram write y in terms r and θ .

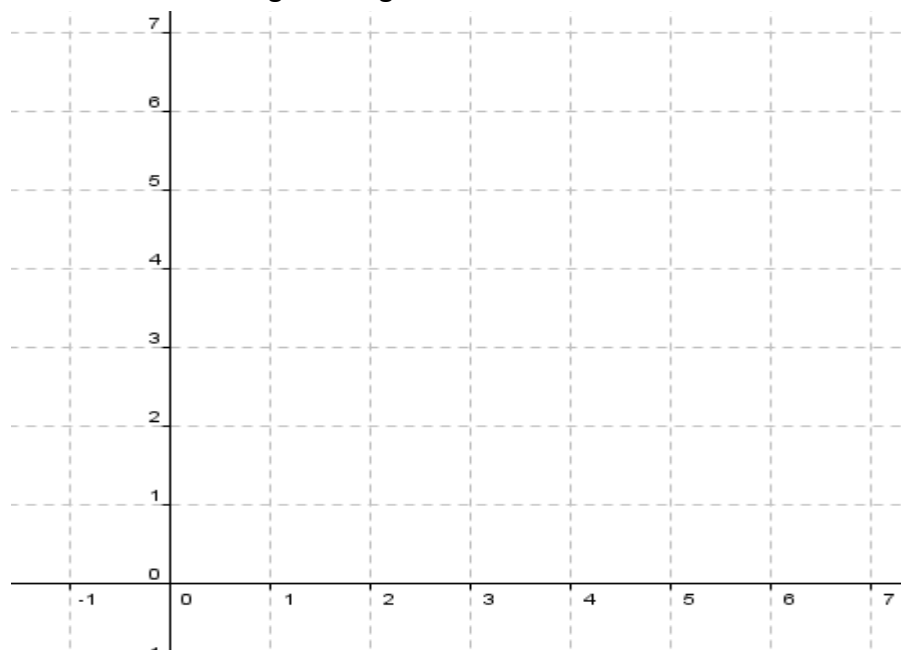
- c. Use your answers to a. and b. to write the complex number in terms of r and θ . This is known as its polar form.

- d. What is $\tan \theta$ in terms of x and y .

- e. Given x and y how can you find θ ?

2.

a. Draw $3+4i$ on the Argand diagram.



b. Measure and calculate R the modulus of $3+4i$.

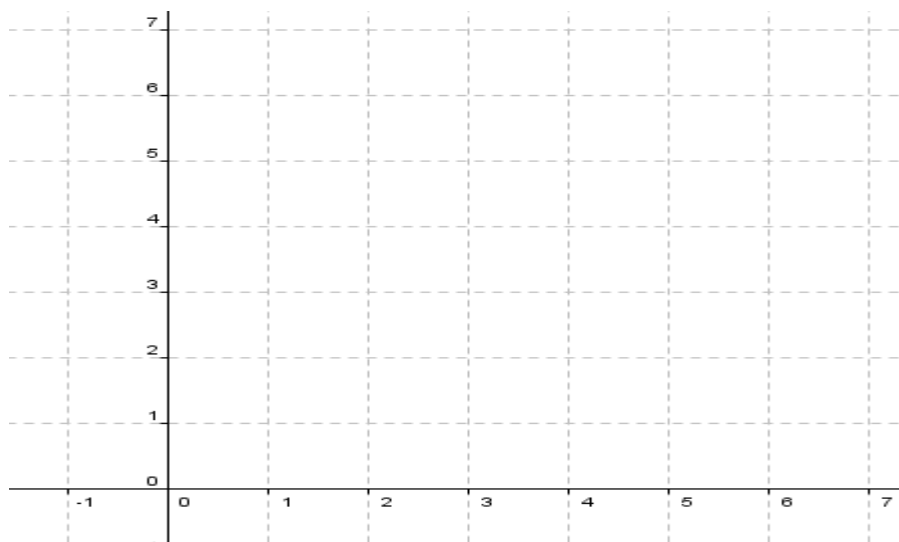
c. Measure and calculate the angle θ which $3+4i$ makes with the positive Real Axis.

d. Express the angle $3+4i$ makes with the Real Axis in radians.
 (Note: 1 radian = $180/\pi$ degrees)

e. Write $3+4i$ in the form $r(\cos \theta + i \sin \theta)$.

3.

a. Draw $-2 + 5i$ on the Argand diagram.



b. Calculate the modulus r of $-2+5i$?

c. Measure and calculate the angle θ which $-2+5i$ makes with the positive Real axis.

d. Express θ in radians.

(Note: 1 radian = $180/\pi$ degrees)

e. Write $-2 + 5i$ in the form $r(\cos\theta + i \sin\theta)$.

4. If you know the polar form of a complex number, what two pieces of information do you know about this complex number?

5. Express $3+2i$ in polar form.

6. Express $-3+4i$ in polar form.

7. Express $-2-5i$ in polar form.

8. Express $2-3i$ in polar form.

9. Write $6.4(\cos 0.67 + i \sin 0.67)$ in the rectangular form. Give your answer correct to 1 decimal place.

10. Write $\frac{1}{\sqrt{2}} + i\frac{\sqrt{2}}{2}$ in polar form
