Warm-Up

SOLUTION!!!

Express the following as a complex number in standard form $(a + bi)$.

$$3i^5 + (2i^6)^5 + \frac{(-1+2i)-3(2+i)}{(-2+i)^2}$$

$3(i^2)^2 i + 32(i^2)^{15} + \frac{-7-i}{4-4i+i^2}$

$3i - 32 + \frac{-7-i}{3-4i}\left(\frac{3+4i}{3+4i}\right)$

$3i - 32 + \frac{-21-28i-3i+4}{9-16i^2}$

$3i - 32 + \frac{-17}{25} - \frac{31}{25}i$

$\left(-\frac{32}{1} - \frac{17}{25}\right) + \left(\frac{3}{1} - \frac{31}{25}\right)i$

$= -\frac{817}{25} + \frac{44}{25}i$

```
3i^5+(2i^6)^5+((
-1+2i)-3(2+i))/(
-2+i)^2
      -32.68+1.76i
Ans▸Frac
   -817/25+44/25i
■
```

7.d) $xi + yi^2 - 3xi + 3yi^2 = \frac{2}{i}\left(\frac{i}{i}\right)$

$$xi - y - 3xi - 3y = -2i$$

$Re = Re$	$Im = Im$
$-4y = 0$	$x - 3x = -2$
$y = 0$	$-2x = -2$
	$x = 1$

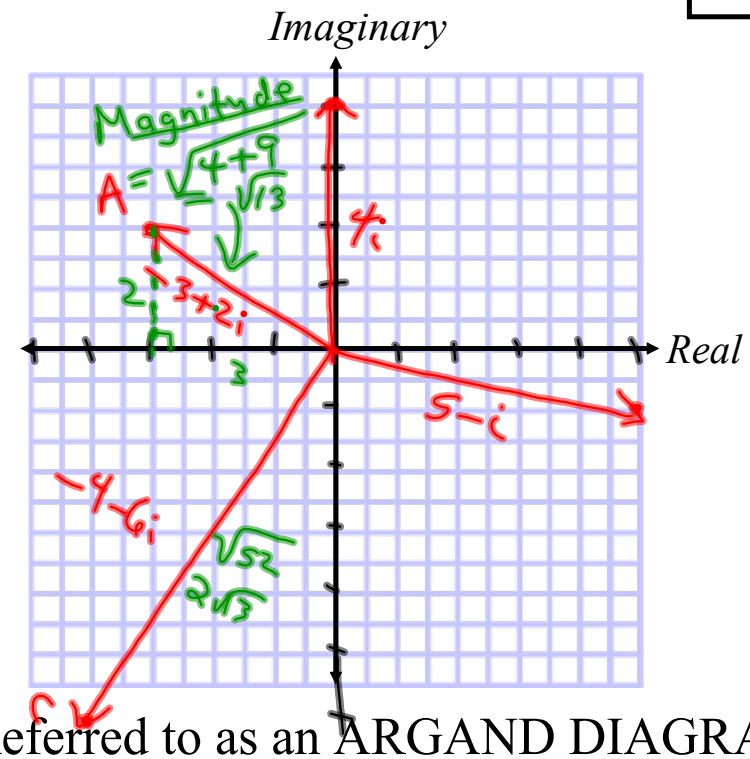
Complex Plane

Argand Diagram

We can represent complex numbers in the **complex plane.**

We use the **horizontal axis** for the **real part** and the **vertical axis** for the **imaginary part.**

NOTE: (x, y) = (Re, Im)



Examples:

A: $-3 + 2i$ ⇒ (-3, 2)

B: $5 - i$ (5, -1)

C: $-4 - 6i$

D: $4i$ (0, 4)

Referred to as an ARGAND DIAGRAM

- the magnitude of a complex vector uses the notation $|a+bi|$ where the length is determined by the Pythagorean Theorem

EXAMPLE... (B) $|-2-4i|$

$= \sqrt{4+16}$

$= \sqrt{20}$

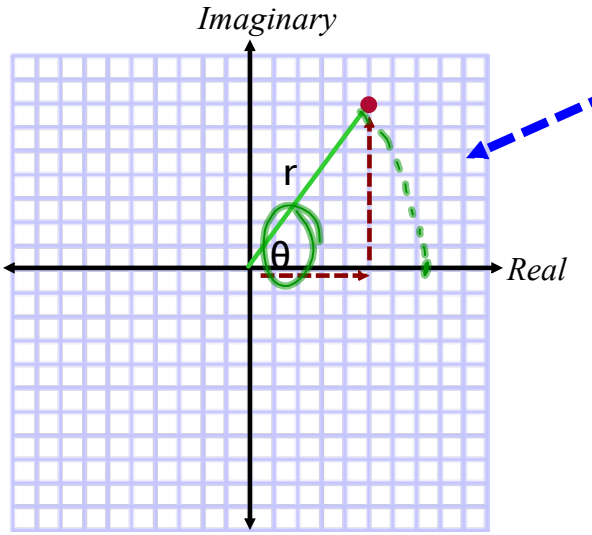
$= 2\sqrt{5}$

Formula: $|a+bi| = \sqrt{a^2+b^2}$

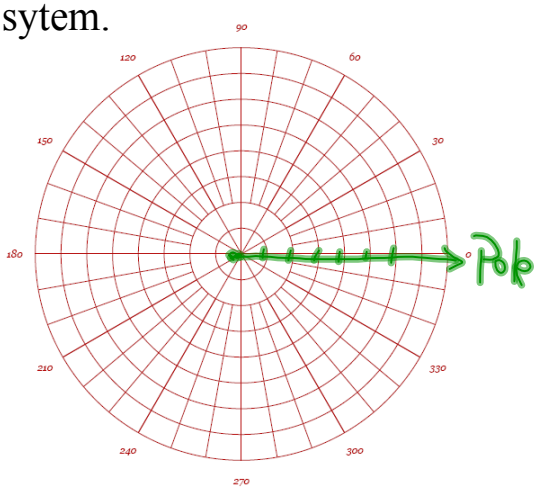
Polar Coordinate System

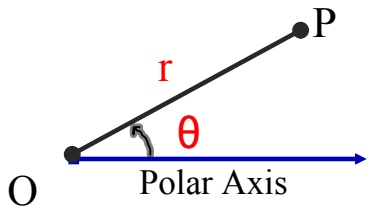
Graphing system that plots ordered pairs of the form (r, θ).

- "r" is the absolute value or modulus. The distance from the origin to the point.
- θ is the angle of rotation from the starting position, referred to as the "pole".
- to locate a point, start with the point O, called the **pole** and a particular ray with its endpoint at O along the **polar axis**.



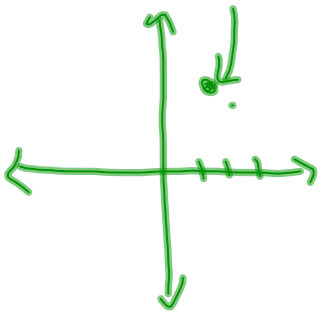
This is referred to as a rectangular coordinate sytem.





The ordered pair (r, θ) is referred to as the polar coordinates of P

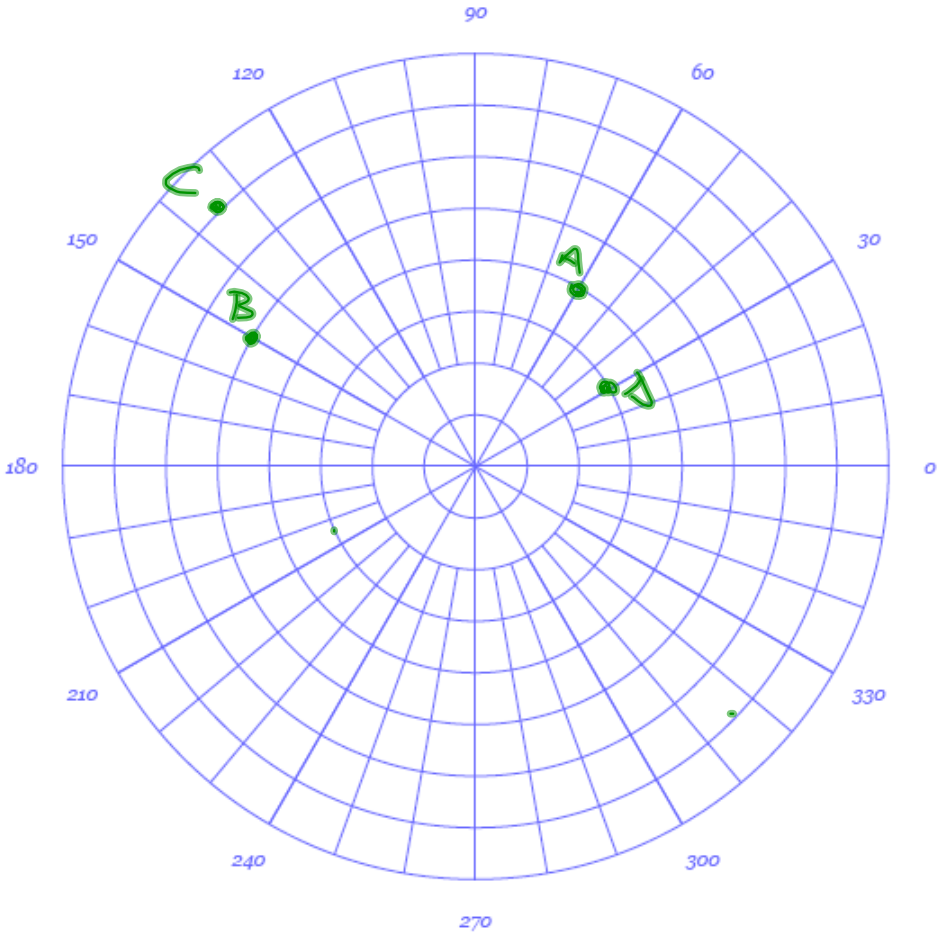
ex. (3, 75°)



Plotting Polar Coordinates:

Plot each of the following points:

A $(4 , 60^{o})$ B $(5 , -210^{o})$ C $(-7 , 315^{o})$ D $(-3 , -150^{o})$



$\frac{3\pi}{4}$

$\frac{3(180^\circ)}{4}$

Homework…

Assignment - Plotting Polar Coordinates.doc

Attachments

Worksheet - Plotting Polar Coordinates.doc