Warm Up

Simplify the following:

a) i^{1028}

$= 1$

b) i^{62}

$= i^{60} \cdot i^{2}$

$= (1)(-1)$

$= -1$

c) i^{-26}

$= \left(\frac{1}{i}\right)^{26}$

$= \left(\frac{1}{i}\right)^{24} \cdot \left(\frac{1}{i}\right)^{2}$

$= (1)(-1)$

$= -1$

Questions From Homework

③ g) $3i(2i^2-5i+2)$

$6i^3-15i^2+6i$

$6(-i)-15(-1)+6i$

$-6i+15+6i$

15

④ c) i^{-13}

$=\left(\frac{1}{i}\right)^{13}$

$=\left(\frac{1}{i}\right)^{12}\cdot\left(\frac{1}{i}\right)$

$=\frac{1}{1}\cdot\frac{1}{i}$

$=\frac{1}{i}\cdot\frac{i}{i}$

$=\frac{i}{(i^2)}$

$\boxed{=-i}$

h) i^{100}

$\boxed{=1}$

$\rightarrow$ Let $y=0$

Calculate the x-intercepts (roots) of the following functions

$$y = x^2 - 2x + 5 \qquad x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$0 = x^2 - 2x + 5$$

$$x = \frac{2 \pm \sqrt{(-2)^2 - 4(1)(5)}}{2(1)}$$

$$= \frac{2 \pm \sqrt{4 - 20}}{2}$$

$$= \frac{2 \pm \boxed{\sqrt{-16}}}{2} \longrightarrow \sqrt{16} \cdot \sqrt{-1} \quad 4i$$

$$= \frac{2 \pm 4i}{2}$$

$$\boxed{= 1 \pm 2i}$$

Two imaginary roots

Solve for x

Common Denominator $= (x+2)(x+3)$

$$\frac{3\,(x+2)\cancel{(x+3)}}{\cancel{(x+3)}} - \frac{2\,\cancel{(x+2)}(x+3)}{\cancel{(x+2)}} = 1\,(x+2)(x+3)$$

$$3(x+2) - 2(x+3) = (x+2)(x+3)$$

$$3x+6-2x-6 = x^2+5x+6$$

$$x = x^2+5x+6$$

$$0 = x^2+4x+6$$

$$x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$$

$$x = \frac{-4 \pm \sqrt{(4)^2-4(1)(6)}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{16-24}}{2}$$

$$x = \frac{-4 \pm \boxed{\sqrt{-8}}}{2}$$

$$x = \frac{-4 \pm 2i\sqrt{2}}{2}$$

$$\boxed{x = -2 \pm i\sqrt{2}}$$

$$\frac{3}{x+3} - \frac{2}{x+2} = 1$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{3(x+2) - 2(x+3)}{(x+3)(x+2)} = 1$$

$$\frac{3x+6-2x-6}{x^2+5x+6} = 1$$

$$\frac{x}{x^2+5x+6} = \frac{1}{1}$$

$$x = x^2+5x+6$$

$$0 = x^2+4x+6$$

The Argand Plane

Complex numbers can be represented geometrically in the complex plane, often called the Argand plane after Jean R. Aragand who gave the representation in 1806.

The complex number 3 + 2i is represented by the directed line segment, or vector, from the origin to the point (3, 2). The horizontal axis is the ***real axis,*** and the vertical axis is the ***imaginary axis.*** Real numbers, such as 5 are written in the form 5 + 0i and are represented by points on the real axis. Pure imaginary numbers such as 3i, are written 0 + 3i and are represented by points on the imaginary axis