## Answer on Question #71420 – Math– Complex Analysis Question

What is the argument of z=-4.

## Solution

We write the complex number in the form  $z = |z|(\cos \varphi + i \sin \varphi)$ .  $|z| - \text{modulus of the complex number } (|z| = \sqrt{a^2 + b^2} \text{ for } z = a + bi), \varphi \text{ is called the argument}$ of the complex number  $(\cos \varphi = \frac{a}{\sqrt{a^2 + b^2}}, \sin \varphi = \frac{b}{\sqrt{a^2 + b^2}} \text{ for } z = a + bi).$  $z = -4 + i \cdot 0$ , hence  $|z| = \sqrt{(-4)^2 + 0^2} = 4$ . Hence we obtain a system of equations

 $\begin{cases} \cos \varphi = -1 \\ \sin \varphi = 0 \end{cases} \rightarrow \varphi = \pi \text{ (radian) or } \varphi = 180^{\circ} \text{ (degrees)} \\ \text{Answer: } \varphi = \pi \text{ (radians) or } \varphi = 180^{\circ} \text{ (degrees).} \end{cases}$