## Answer on Question \#71420 - Math- Complex Analysis

Question

What is the argument of $\mathrm{z}=-4$.

## Solution

We write the complex number in the form $z=|z|(\cos \varphi+i \sin \varphi)$.
$|z|$ - modulus of the complex number $\left(|z|=\sqrt{a^{2}+b^{2}}\right.$ for $\left.z=a+b i\right), \varphi$ is called the argument of the complex number ( $\cos \varphi=\frac{a}{\sqrt{a^{2}+b^{2}}}, \sin \varphi=\frac{b}{\sqrt{a^{2}+b^{2}}}$ for $z=a+b i$ ).
$z=-4+i \cdot 0$, hence $|z|=\sqrt{(-4)^{2}+0^{2}}=4$. Hence we obtain a system of equations
$\left\{\begin{array}{c}\cos \varphi=-1 \\ \sin \varphi=0\end{array} \rightarrow \varphi=\pi\right.$ (radian) or $\varphi=180^{\circ}$ (degrees)
Answer: $\varphi=\pi$ (radians) or $\varphi=180^{\circ}$ (degrees).

