

## Answer on Question #74587 – Math – Algebra

### Question

Express  $z = 1/(-5-i)$  in standard (algebraic) form. Further, give an Argand diagram in which  $z$ ,  $\bar{z}$  and  $-z$  are plotted?

$$z = \frac{1}{-5-i}$$

### Solution

1. We get rid of irrationality in the denominator. For this, we multiply the numerator and denominator by the same number, the complex conjugate of the denominator:

$$\frac{1}{-5-i} = \frac{(-5+i)}{(-5-i)(-5+i)};$$

2. Multiply and immediately divided into one number, that is nothing has changed. We will open the brackets.

$$\frac{1}{-5-i} = \frac{(-5+i)}{(-5-i)(-5+i)} = \frac{-5+i}{25+5i-5i-i^2};$$

3. Simplify.

$$\frac{1}{-5-i} = \frac{(-5+i)}{(-5-i)(-5+i)} = \frac{-5+i}{25+5i-5i-i^2} = -\frac{5}{26} + \frac{i}{26};$$

$$4. -z = \frac{5}{26} - \frac{i}{26}; \bar{z} = -\frac{5}{26} - \frac{i}{26};$$

$$\text{Answer: } z = -\frac{5}{26} + \frac{i}{26}; \bar{z} = -\frac{5}{26} - \frac{i}{26}; -z = \frac{5}{26} - \frac{i}{26}.$$

Argand diagram:  $-\frac{5}{26} \approx -0.1923$ ;  $\frac{1}{26} \approx 0.0384$ .

Argand diagram

