

**Answer on Question#40611 – Math – Algebra**

Find X and Y for the following equations :

$$x+y = 20$$

$$X^2 - 4x + 5y = 20$$

**Solution:**

System of equations:

$$\begin{cases} x + y = 20 \\ x^2 - 4x + 5y = 20 \end{cases}$$

From the first equation:

$$y = 20 - x$$

Now we can substitute y in second equation:

$$x^2 - 4x + 5(20 - x) = 20$$

$$x^2 - 4x + 100 - 5x = 20$$

$$x^2 - 9x + 80 = 0$$

This quadratic equation has only complex roots (no real roots):

$$x_1 = \frac{1}{2}(9 - i\sqrt{239})$$

$$x_2 = \frac{1}{2}(9 + i\sqrt{239})$$

Now we can find value of y using back

$$y_1 = 20 - x_1 = 20 - \frac{1}{2}(9 - i\sqrt{239}) = \frac{1}{2}(31 + i\sqrt{239})$$

$$y_2 = 20 - x_2 = 20 - \frac{1}{2}(9 + i\sqrt{239}) = \frac{1}{2}(31 - i\sqrt{239})$$

**Answer:** solution of the system of equations:

$$\begin{cases} x_1 = \frac{1}{2}(9 - i\sqrt{239}) \\ y_1 = \frac{1}{2}(31 + i\sqrt{239}) \end{cases} \begin{cases} x_2 = \frac{1}{2}(9 + i\sqrt{239}) \\ y_2 = \frac{1}{2}(31 - i\sqrt{239}) \end{cases}$$