$$\sqrt{x+5}=x+3$$

(1)

$$x+5=x^2+6x+9$$

(2)

$$x^2+5x+4=0$$

(3)

$$(x+4)(x+1)=0$$

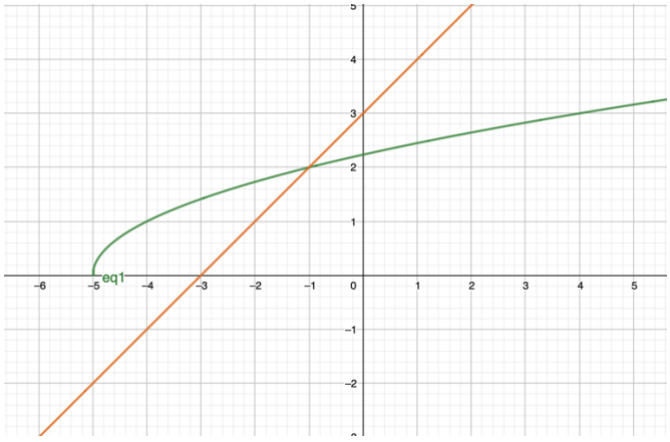
$$x=-4 \text{ or } x=-1$$

I think that -1 in the correct solution because in incorrect solution arises as a result of step (1)

If we were to substitute **-4** into the original equation, we would have the situation below:

$$\sqrt{-4+5} = -4+3$$
$$\sqrt{1} \neq -1$$
$$1 \neq -1$$

This is a problem because even though the both $(-1)^2$ **and** 1^2 **have 1 as the solution**, this does not mean that **-1 = 1**
The square root of 1 in the example is a type of **many-to-one function**, however the original question would be a case of **one-to-many**, which is not a function.
If we were to graph the original question using GeoGebra, then it would look something like this:



The green line is $\sqrt{x+5}$ and the orange line is **x+3** and the point at which they intersect is **-1**.
This graph proves that the original question has only one possible solution.

The -4 result arises because we will always get a **positive integer when we square numbers**, even if they are negative.
Both -4 and -1 become a solution when we square both sides of the equation like we did in **step (1)**, but if left in the original function form, then the question has **only one solution which is -1.**