Problem:

Solve the irrational equation.

$\sqrt{3x^2+5x+8}-\sqrt{3x^2+5x+5}=1.$

Solution:

$\sqrt{3x^2+5x+8}-\sqrt{3x^2+5x+5}=1 \Rightarrow \sqrt{3x^2+5x+8}=1+\sqrt{3x^2+5x+5}$, let's square:

$3x^2+5x+8=1+2\sqrt{3x^2+5x+1}+3x^2+5x+1, \Rightarrow \sqrt{3x^2+5x+1}=3, let's quaring\ again$:

$3x^2+5x+1=9 \Rightarrow 3x^2+5x-8=0 \Rightarrow x_1=-\frac{8}{3}, x_2=1.$

Let's check the roots:

$x_1=-\frac{8}{3} \Rightarrow \sqrt{16}-\sqrt{9}=1, \qquad x_2=1 \Rightarrow \sqrt{16}-\sqrt{9}=1 \Rightarrow everything's\ correct.$

$Answer: x_1=-\frac{8}{3}, x_2=1.$