

PROOF THAT  $2 = 3$ 

Up to the point where I said that

$$\sqrt{(2 - 5/2)^2} = \sqrt{(3 - 5/2)^2}$$

everything was fine. The problem starts with the next line.

You hear everyday that  $\sqrt{x^2} = x$  but that is only true if  $x \geq 0$

If  $x$  is, for example,  $-2$ , then, can we say that  $\sqrt{(-2)^2} = -2$ ? The answer is NO. The symbol  $\sqrt{x}$

represents the principal square root of  $x$  which is a positive number.

If  $x$  can be positive or negative, we have to say that  $\sqrt{x^2} = |x|$ .

For example  $\sqrt{(-2)^2} = |-2| = 2$ . So,

after the line  $\sqrt{(2 - 5/2)^2} = \sqrt{(3 - 5/2)^2}$

we can only conclude that

$$|2 - 5/2| = |3 - 5/2|$$

and NOT that  $2 - 5/2 = 3 - 5/2$