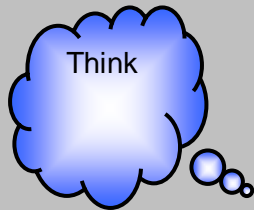
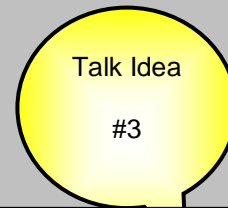
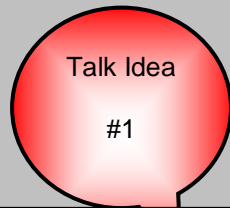


## Talk Frame Model - Extraneous Solutions



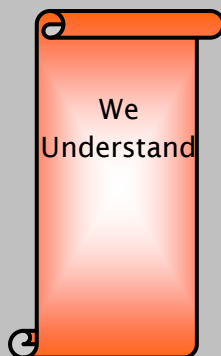
Joe and Cindy are asked the following question:

At what  $x$ -value(s?) do the following equations intersect:  
 $y = \sqrt{x-1} - 3$  and  $y = x - 10$ . **Joe** says the answers are  $x=10$  and  $x=5$ . **Cindy** says the answer is  $x=10$ . What methods do you think each student used? Who do you agree with and why?



Plug in	Graphically	Algebraically
Some students will just plug in 10 and 5 into both equations and see that 5 doesn't work. This will lead them to agree with Cindy.	Recently, students have seen how to graph using their calc or desmos, so they can graph and see the only solution is (10,0) and agree with Cindy.	"I algebraically solved it and got Joe's answer so I agree with Joe." or They could solve algebraically and say they ended up with a quadratic, and those usually have two answers and Joe has two answers, so Joe is right.

What's a potential goal(s) for the discussion? What should students come to better "understand"?



The goal of this is to try and get students to understand that they need to check for extraneous solutions. Also, I would like to show them where these solutions come from, and that if you graph each step in the algebraic method, these solutions 'appear', therefore we create the extraneous solution.