Radical Functions

1. Given the function ,

* Plot a point on the coordinate grid to show the *x*-intercept of the function.
* Plot a point on the coordinate grid to show the *y*-intercept of the function.

A coordinate plane with an x-axis and y-axis. The x-axis is goes from -8 to 8 in increments of 2. The y-axis goes from -8 to 8 in increments of 2.

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1. Enter the value of *x* that makes the equation true.
2. Enter the values of *y* that make the equation true.
3. Select whether each equation has no real solutions, one real solution, or   
   infinitely many real solutions.

| **Equation** | **No Real Solutions** | **One Real Solution** | **Infinitely Many Real Solutions** |
| --- | --- | --- | --- |
|  |  |  |  |
| 0 |  |  |  |
|  |  |  |  |

1. A student was finding the solution to the equation and wrote the   
   five steps shown.  
     
   Step 1:   
   Step 2:   
   Step 3:   
   Step 4:   
   Step 5: 3 = *x*  
     
   The student states that *x* = 3 is the solution to the equation .  
     
   Explain why *x* = 3 cannot be a solution to the equation . Use evidence from the equation in your explanation.
2. Blake was finding the solutions to the equation and wrote the   
   steps shown.  
     
   Step 1:   
   Step 2:   
   Step 3:   
   Step 4:   
   Step 5:   
   Step 6:   
   Step 7: *x* = 2, –2, and 0.25  
     
   Blake thinks that –2 cannot be a solution to the original equation because (–2)3 would be a negative value and you cannot have a negative value under a square root in the original equation. Blake points to step 2 as the step that produced the erroneous answer of –2.  
     
   Do you agree to disagree with Blake? Explain why.
3. Determine whether each statement is True for All values of *x*, True for Some values of *x*, or   
   Not True for Any values of *x*.

| **Statement** | **True for All** | **True for Some** | **Not True for Any** |
| --- | --- | --- | --- |
| If , then |  |  |  |
| If , then |  |  |  |
| If , then |  |  |  |

**Teacher Material**

A-SSE.A

Interpret the structure of expressions.

A-CED.A

Create equations that describe numbers or relationships.

A-REI.A

Understand solving equations as a process of reasoning and explain the reasoning.

F-IF.A

Understand the concept of a function and use function notation.

F-IF.C

Analyze functions using different representations.

F-BF.A

Build a function that models a relationship between two quantities.

| **Question** | **Claim** | **Key/Suggested Rubric** |
| --- | --- | --- |
| 1[[1]](#footnote-1) | 1 | **2 points:** Plots a point at (0, 1) AND a point at (5, 0).  **1 point:** Plots a point at (0, 1) OR a point at (5, 0). |
| 21 | 1 | **2 points:** Plots a point at (0, 3) AND a point at (9, 0).  **1 point:** Plots a point at (0, 3) OR a point at (9, 0). |
| 3[[2]](#footnote-2) | 1 | **1 point:** *x* = 53 |
| 4[[3]](#footnote-3) | 1 | **1 point:** Writes 3 values for *y*: one in the interval –12.5 to –12.4, inclusive, one in the interval 3.2 to 3.3, inclusive, and one in the interval 9.1 to 9.2, inclusive. |
| 52 | 1 | **1 point:**   | **Equation** | **No Real Solutions** | **One Real Solution** | **Infinitely Many Real Solutions** | | --- | --- | --- | --- | |  | x |  |  | |  |  | x |  | |  |  |  | x | |
| 6[[4]](#footnote-4) | 3 | **1 point:** Answers will vary. **Example:** *x* can’t be 3 because there is no real solution to the equation. The equation says that 3 plus some number is 2, which means that number has to be equal to –1. But the square root of a real number can’t be –1, so *x* can’t be equal to 3. |
| 74 | 3 | **1 point:** The student disagrees with Blake and shows or explains how –2 (or any negative number less than the cubed root of 17) can be a solution to the original equation. NOTE: No credit is earned for simply disagreeing with Blake. |
| 84 | 3 | **1 point:**   | **Statement** | **True for All** | **True for Some** | **Not True for Any** | | --- | --- | --- | --- | | If , then | x |  |  | | If , then |  | x |  | | If , then |  | x |  | |

1. From Smarterbalanced.org. Grade 11, Claim 1, Target M Item Specifications. Internet. Available from <http://www.smarterbalanced.org/smarter-balanced-assessments/>; accessed 11/2015. [↑](#footnote-ref-1)
2. From Smarterbalanced.org. Grade 11, Claim 1, Target H Item Specifications. Internet. Available from <http://www.smarterbalanced.org/smarter-balanced-assessments/>; accessed 11/2015. [↑](#footnote-ref-2)
3. Adapted from Smarterbalanced.org. Grade 11, Claim 1, Target H Item Specifications. Internet. Available from <http://www.smarterbalanced.org/smarter-balanced-assessments/>; accessed 11/2015. [↑](#footnote-ref-3)
4. From Smarterbalanced.org. Grade 11, Claim 3 Item Specifications. Internet. Available from <http://www.smarterbalanced.org/smarter-balanced-assessments/>; accessed 11/2015. [↑](#footnote-ref-4)