Rational Functions

1. Jim can paint a house in 25 hours. Alex can paint the same house in 20 hours.  
     
   Write an equation that can be used to find the time in hours, *t*, it would take Jim and Alex to paint the house together assuming they both work at the rates they work when working alone.
2. What value of *x* makes the equation true?
3. What value of *t* makes the equation true?
4. 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** |
| --- | --- | --- | --- |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

1. Select Yes or No to indicate whether each value of *b* is a solution to the given equation.

| **Solution** | **Yes** | **No** |
| --- | --- | --- |
| *b* = –8 |  |  |
| *b* = –5 |  |  |
| *b* = –2 |  |  |
| *b* = 22 |  |  |

1. Beth is solving this equation: .  
     
   She says, “I can multiply both sides by *x* and get the linear equation 1 + 3*x* = 3,   
   whose solution is *x* = .”  
     
   Which of the following statements makes this a correct argument, or shows that it is incorrect? Select **all** that apply.  
     
   A. You can assume because both sides are undefined if *x* = 0.  
   B. After multiplying both sides by *x* you need to subtract 1 from both sides.  
   C. You cannot multiply both sides by *x* because you do not know what *x* is.  
   D. The equation is not linear, so you cannot use the methods normally used for solving

linear equations.

**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-BF.A

Build a function that models a relationship between two quantities.

| **Question** | **Claim** | **Key/Suggested Rubric** |
| --- | --- | --- |
| 1[[1]](#footnote-1) | 1 | **1 point:** , or equivalent |
| 2[[2]](#footnote-2) | 1 | **1 point:** *x* = 4 |
| 32 | 1 | **1 point:** *t* = 3 |
| 42 | 1 | **1 point:**   | **Equation** | **No Real Solutions** | **One Real Solution** | **Infinitely Many Real Solutions** | | --- | --- | --- | --- | |  |  | x |  | |  | x |  |  | |  |  |  | x | |
| 5[[3]](#footnote-3) | 1 | **1 point:**   | **Solution** | **Yes** | **No** | | --- | --- | --- | | *b* = –8 |  | x | | *b* = –5 |  | x | | *b* = –2 | x |  | | *b* = 22 |  | x | |
| 6[[4]](#footnote-4) | 3 | **1 point:** Selects A OR Selects A and B |

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