

#### Vertical Progression:

<b>8<sup>th</sup> Grade</b>	<p><b>8.EE.C Analyze and solve linear equations and pairs of simultaneous linear equations.</b></p> <ul style="list-style-type: none"> <li>○ <b>8.EE.C.7</b> Solve linear equations in one variable</li> <li>○ <b>8.EE.C.7a</b> Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form <math>x = a</math>, <math>a = a</math>, or <math>a = b</math> results (where <math>a</math> and <math>b</math> are different numbers.)</li> <li>○ <b>8.EE.C.7b</b> Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.</li> </ul>
<b>Algebra 1</b>	<p><b>ELG.MA.HS.A.8 Understand solving equations as a process of reasoning and explain the reasoning</b></p> <ul style="list-style-type: none"> <li>○ <b>A-REI.1</b> Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.</li> </ul>
<b>Algebra 2</b>	<p><b>ELG.MA.HS.A.8 Understand solving equations as a process of reasoning and explain the reasoning</b></p> <ul style="list-style-type: none"> <li>○ <b>A-REI.1</b> Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.</li> <li>○ <b>A-REI.2</b> Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.</li> </ul>

#### Students will demonstrate command of the ELG by:

- Justifying each step in solving simple equations.
- Explaining how/why various steps preserve the equality relationship.

#### Vocabulary:

- addition property of equality
- equation / equality
- multiplication property of equality
- solution
- viable argument

**Sample Instructional/Assessment Tasks:**

**1) Standard(s): A-REI.A.2**

Source: PARCC Algebra 2 EOY Practice Test

Item Prompt:

What extraneous solution arises when the equation  $\sqrt{x+3} = 2x$  is solved for  $x$  by first squaring both sides of the equation?

Correct Answer:

$$x = -\frac{3}{4}$$

**2) Standard(s): A-REI.A.2**

Source: <https://www.illustrativemathematics.org/content-standards/HSA/REI/A/2/tasks/1927>

Item Prompt:

Meagan is working on solving the equation  $\frac{2}{x^2-1} - \frac{1}{x-1} = \frac{1}{x+1}$ .

She says, "If I clear the denominators, I find that the only solution is  $x = 1$ , but when I substitute  $x = 1$  the equation does not make sense."

- Is Megan's work correct?
- Why does Megan's work produce an  $x$  value that does not solve the equation?

Correct Answer:

- yes
- She forgot to check for extraneous solutions.