Just In Time Quick Check

Standard of Learning (SOL) AII.3d

Strand: Equations and Inequalities
Standard of Learning (SOL) AII.3d ***The student will solve equations containing radical expressions.***
Grade Level Skills: ● Solve an equation containing no more than one radical expression algebraically and graphically. ● Solve equations and verify algebraic solutions using a graphing utility.
Just in Time Quick Check
Just in Time Quick Check Teacher Notes

Supporting Resources:
● VDOE Mathematics Instructional Plans (MIPS)
  o AII.3d – Radical Expressions (Word)/PDF Version
● VDOE Word Wall Cards: Algebra II (Word) | (PDF)
  o Square Root
  o Cube Root
  o N[th] Root
  o Simplify Radical Expressions
  o Add and Subtract Radical Expressions
  o Product Property of Radicals
  o Quotient Property of Radicals
● Desmos Activity
  o Solving Radical Expressions

Supporting and Prerequisite SOL: AII.1b, AII.6a, AII.6b, A.3a, A.3b, A.3c, 8.3b, 8.17

SOL AII.3d - Just in Time Quick Check

1. Find the solution for the equation: $2\sqrt{7-3x}\ +2=0$. Show your work/thinking.

2. What values of x satisfy the equation $12-4\sqrt[3]{x-5}=0$? Show your work/thinking.

3. Student A was asked to solve the equation $\sqrt{2x^2+1}=1-x$. The student's work is shown below.

$$\sqrt{2x^2+1}=1-x$$
$$(\sqrt{2x^2+1})^2=(1-x)^2$$
$$2x^2+1=1^2-x^2$$
$$2x^2+1=1-x^2$$
$$3x^2+1=1$$
$$3x^2=0$$
$$x=0$$

Describe and correct the errors made.

SOL AII.3d - Just in Time Quick Check Teachers Notes

Common Errors/Misconceptions and their Possible Indications

1. Find the solution for the equation: $2\sqrt{7-3x}+2=0$. Show your work/thinking.

   A common error some students may make is to not check their solutions. This may indicate that some students do not know that this equation when simplified, $\sqrt{7-3x}=-1$, may result in an extraneous solution. Teachers may want to demonstrate how a false statement like -5 = 5 can be manipulated into a true statement by squaring both sides of the equation. This will allow teachers to show that even though students may attempt to justify their work using the proper steps, checking their solutions is highly important. It may also be helpful for teachers to use a simpler problem such as $\sqrt{x}=-4$. Teachers could have students use Desmos to graph the left and right side of the equations separately to look for a point of intersection. When $y=2\sqrt{7-3x}+2$ and $y=0$ are graphed they do not intersect which indicates there is not a solution. Using the Desmos activity, Solving Radical Expressions, in the Supporting Resources of this Quick Check may be helpful for students.

2. What values of x satisfy the equation $12-4\sqrt[3]{x-5}=0$? Show your work/thinking.

   A common error students may make is to fail to completely isolate the radical on the left side of the equation. This might indicate that a student does not know how to successfully move the coefficient in front of the radical. Neglecting to completely isolate the radical can result in a more complex equation. Teachers may want to use a simpler radical equation such as $2+5\sqrt[3]{x}=7$ to demonstrate how to properly isolate the equation.

3. Student A was asked to solve the equation $\sqrt{2x^2+1}=1-x$. The student's work is shown below.

$$\begin{gathered}\sqrt{2x^2+1}=1-x\\ (\sqrt{2x^2+1})^2=(1-x)^2\\ 2x^2+1=1^2-x^2\\ 2x^2+1=1-x^2\\ 3x^2+1=1\\ 3x^2=0\\ x=0\end{gathered}$$

   Describe and correct the errors made.

   A common error some students make is to square each of the two terms separately instead of squaring the binomial expression on the right side of the equation. This may indicate that the student does not understand how to properly square a binomial. It might be beneficial to show students who make this type of error a graphical representation of $(1-x)^2$ and $1-x^2$ and compare the two graphs. Teachers may find it beneficial to have students create a graphic organizer concerning multiplying binomial expressions. Using Desmos to verify solutions would help students identify there is more than one solution so they would know to go back and rework the problem.