

NWEA Assessment Item Illustrating 8.EE.A.2

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Domain: Expressions and Equations

8.EE.A: Work with radicals and integer exponents.

Calculator Availability: No

Use the equation to answer the question.

$$x^2 + 9 = 16$$

What values for x make the equation true? Select all that apply.

<input type="checkbox"/> A. -7
<input type="checkbox"/> B. -5
<input type="checkbox"/> C. $-\sqrt{7}$
<input type="checkbox"/> D. $-\sqrt{5}$
<input type="checkbox"/> E. $\sqrt{5}$
<input type="checkbox"/> F. $\sqrt{7}$
<input type="checkbox"/> G. 5
<input type="checkbox"/> H. 7

Alignment: 8.EE.A.2: Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.

As students begin to work with square roots and cubic roots, they will draw on their multiplication facts to evaluate small perfect squares and cube roots quickly. When taking the square root in the process of solving an equation, students must consider the positive and negative square roots. This item presents two perfect squares in the given equation, and students must recognize that an operation should be performed before taking the square root of 7.

Coherence: This standard fits into the suite of equation-solving skills that students have been building. Students are asked to find which values from the specified set belong to the solution set of the given equation, which builds upon equation-solving and reasoning from grade 6.^{6.EE.B.5} In grade 7, students learned to fluently solve equations of the form $px + q = r$, where p , q , and r were specific rational numbers.^{7.EE.B.4} Being able to evaluate perfect squares helps grade 8 students work with and make approximations of irrational numbers.^{8.NS.A} This item may allow students to connect the form of the equation $x^2 + 3^2 = 4^2$ to their work with the Pythagorean Theorem in the Geometry domain.^{8.G.B} In grade 8, students evaluate only perfect squares and perfect cubes, whereas in high school they will learn and apply the properties of rational exponents to evaluate and rewrite expressions.^{HSN-RN.A}

Rigor: This item attends to procedural skill. Students consider an equation and select the solutions that make the equation true.

Answer Key:

Use the equation to answer the question.

$$x^2 + 9 = 16$$

What values for x make the equation true? Select all that apply.

<input type="checkbox"/>	A. -7
<input type="checkbox"/>	B. -5
<input checked="" type="checkbox"/>	C. $-\sqrt{7}$
<input type="checkbox"/>	D. $-\sqrt{5}$
<input type="checkbox"/>	E. $\sqrt{5}$
<input checked="" type="checkbox"/>	F. $\sqrt{7}$
<input type="checkbox"/>	G. 5
<input type="checkbox"/>	H. 7

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