

Just In Time Quick Check
Standard of Learning (SOL) A.3a

Strand: Expressions and Operations

Standard of Learning (SOL) A.3a

The student will simplify square roots of whole numbers and monomial algebraic expressions.

Grade Level Skills:

- Express the square root of a whole number in simplest form.
- Express the principal square root of a monomial algebraic expression in simplest form where variables are assumed to have positive values.

Just in Time Quick Check

Just in Time Quick Check Teacher Notes

Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
 - [A.3a - Simplifying Square Roots of Whole Numbers](#) (Word) / [PDF Version](#)
 - [A.3a - Simplifying Square Roots of Monomial Expressions](#) (Word) / [PDF Version](#)
- VDOE Algebra Readiness Formative Assessments
 - [A.3](#) (Word) / [PDF](#)
- VDOE Word Wall Cards: Algebra I [\(Word\)](#) | [\(PDF\)](#)
 - Square Root
 - Simplify Numerical Expressions Containing Square or Cube Roots

Supporting and Prerequisite SOL: [8.3a](#), [8.3b](#), [8.9b](#), [7.1d](#)

SOL A.3a - Just in Time Quick Check

- 1) Determine if the given expression is written in simplest radical form. Explain your reasoning.

$$-\sqrt{150}$$

- 2) Write the given expression in simplest radical form. Variables are assumed to have positive values. Show your work/thinking.

$$\sqrt{196x^3y^4z^9}$$

- 3) Student A was asked to simplify the expression. Variables are assumed to have positive values.

$$-4a^5\sqrt{162a^3b^2}$$

Student A obtained the following result:

$$-3a^6b\sqrt{2a}$$

Determine if this answer is correct or incorrect. Justify your thinking.

SOL A.3a - Just in Time Quick Check Teacher Notes

Common Errors/Misconceptions and their Possible Indications

- 1) Determine if the given expression is written in simplest radical form. Explain your reasoning.

$$-\sqrt{150}$$

A common error some students may make is to transpose the resulting simplified expression writing $6\sqrt{5}$ instead of $5\sqrt{6}$. This may indicate a student understands how to simplify a radical expression, but doesn't understand which number stays inside the radical. The teacher should make sure students are familiar with what it means to take the square root of a number. Providing visual models of square numbers to show the relationship between squares and square roots may help. Also, the use of Desmos to verify equivalence between the problem and simplified expression may be helpful.

- 2) Write the given expression in simplest radical form. Variables are assumed to have positive values. Show your work/thinking.

$$\sqrt{196x^3y^4z^9}$$

A misconception students may have is to simplify y^4 and z^9 resulting in y^2 and z^3 . This indicates that a student treats exponents like a coefficient of a monomial expression. Teachers may want to have students write each exponent in expanded form to help students visualize groups of two.

- 3) Student A was asked to simplify the expression. Variables are assumed to have positive values.

$$-4a^5\sqrt{162a^3b^2}$$

Student A obtained the following result:

$$-3ab\sqrt{2a}$$

Determine if this answer is correct or incorrect. Justify your thinking.

A common error students may make is to simplify under the radical but fail to multiply by the outside factor. This may indicate they do not see the outside factor as multiplication. The teacher may want to have the student rewrite the problem as $-4a^5 \cdot \sqrt{162} \cdot \sqrt{a^3} \cdot \sqrt{b^2}$ or have them state the problem verbally.