Just In Time Quick Check

Standard of Learning (SOL) A.3c

Strand: Expressions and Operations

Standard of Learning (SOL) A.3c

The student will simplify numerical expressions containing square or cube roots.

Grade Level Skills:

- Simplify a numerical expression containing square or cube roots.
- Add, subtract, and multiply two monomial radical expressions limited to a numerical radicand.

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Just in Time Quick Check Teacher Notes

Supporting Resources:

- VDOE Mathematics Instructional Plans (MIPS)
  - A.3c - Simplify Numerical Expressions with Square and Cube Roots (Word) / PDF Version
- VDOE Algebra Readiness Formative Assessments
  - A.3 (Word) / PDF
- VDOE Word Wall Cards: Algebra I (Word) | (PDF)
  - Add and Subtract Monomial Radical Expressions
  - Product Property of Radicals
  - Quotient Property of Radicals
- Desmos Activity
  - Card Sort: Numerical Expressions with Square and Cube Roots

Supporting and Prerequisite SOL: A.3a, A.3b, 8.3a, 8.3b, 8.14a, 7.1d

SOL A.3c - Just in Time Quick Check

1) Simplify the expression. Show your work/thinking.

$$10\sqrt{7} + \sqrt{8}$$

2) Write the expression in simplest radical form. Show your work/thinking.

$$(\sqrt[3]{12})(\sqrt[3]{36})$$

3) Simplify the expression. Variables are assumed to have positive values. Show your work/thinking.

$$5\sqrt{8x^3} + 3\sqrt{18x^3}$$

4) Find the area of this rectangle with the given length and width.

$3\sqrt{6}$

$4\sqrt{15}$

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

Common Errors/Misconceptions and their Possible Indications

1) Simplify the expression. Show your work/thinking.

$$10\sqrt{7} + \sqrt{8}$$

A common misconception students may have is to add the radicands. This may indicate the students do not understand that $\sqrt{a} + \sqrt{b} \neq \sqrt{a+b}$. Teachers may want to revisit grouping like terms of an algebraic expression as well as using Desmos to verify if the expressions are equivalent.

2) Write the expression in simplest radical form. Show your work/thinking.

$$(\sqrt[3]{12})(\sqrt[3]{36})$$

A misconception students may have is to simplify the expression as though it is a square root instead of a cube root resulting in $12\sqrt{3}$. This may indicate that the student sees a radical symbol and assumes it is a square root without regard to the indices. The teacher may suggest for students to write each radicand as a product of prime factors and look for (groups of three of same factor) or perfect cubes.

3) Simplify the expression. Variables are assumed to have positive values. Show your work/thinking.

$$5\sqrt{8x^3} + 3\sqrt{18x^3}$$

A common error is not simplifying the variable portion of the radicand resulting in an error of $19\sqrt{2x^3}$. This may indicate students do not recognize that $\sqrt{x^3}$ can be simplified. Teachers may want to have students write the radicand in expanded form as $\sqrt{2 \cdot x \cdot x \cdot x}$ so students can identify that the expression can be simplified further.

4) Find the area of this rectangle with the given length and width.

$3\sqrt{6}$

$4\sqrt{15}$

A common error students may make is to multiply the coefficients and radicands but neglecting to simplify the product of the radicand. This may indicate that students believe simplifying only involves performing the operation of multiplication. Teachers may want to have the students apply the commutative property to rewrite the expression as $4 \cdot 3\sqrt{15 \cdot 6}$ before simplifying.