LESSON MAKER PRO

Radical Remix

Simplify roots and combine exact lengths.

HIGH SCHOOL · A1.N.1

A1.N.1 "Extend the understanding of exponents to include square roots and cube roots. Write square roots and cube roots of constants and monomial algebraic expressions in simplest radical form. Add, subtract, multiply, divide..."

NAME _____ DATE _____

THE BIG IDEA

To simplify a square root or cube root, find a perfect square or perfect cube factor, then take its root. Add or subtract square roots only when the numbers left inside the roots match. To clear a single square root from a denominator, multiply the numerator and denominator by that root.

WORKED EXAMPLE

Write $\sqrt{175}$ in simplest radical form.

1. $\sqrt{175} = \sqrt{(25 \cdot 7)}$
2. $\sqrt{(25 \cdot 7)} = \sqrt{25} \cdot \sqrt{7}$
3. $\sqrt{25} \cdot \sqrt{7} = 5\sqrt{7}$

Answer: $5\sqrt{7}$

PRACTICE 6 problems

1 Write $\sqrt{72}$ in simplest radical form.

ANSWER _____

2 Write $\sqrt{(36x^2)}$ in simplest form. Assume $x \geq 0$.

ANSWER _____

3 Write $\sqrt[3]{(64x^3)}$ in simplest form.

ANSWER _____

4 Simplify $\sqrt{48} + \sqrt{27}$.

ANSWER _____

5 Simplify $\sqrt{6} \cdot \sqrt{24}$.

ANSWER _____

6 Simplify $9/\sqrt{6}$. Rationalize the denominator.

ANSWER _____

APPLY IT Show your work

1 A square laptop sticker has an area of 32 square centimeters. What is its exact side length in simplest radical form?

WORK SPACE

ANSWER _____

2 You have a √96-meter LED strip for a gaming setup. You cut off √54 meters. What is the exact length remaining in simplest radical form?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Simplify (√18 + √8)/√12. Rationalize the denominator and show your steps.

WORK SPACE AND ANSWER

ANSWER KEY # Radical Remix

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Write $\sqrt{72}$ in simplest radical form.	**$6\sqrt{2}$**
2	Write $\sqrt{(36x^2)}$ in simplest form. Assume $x \geq 0$.	**6x**
3	Write $\sqrt[3]{(64x^3)}$ in simplest form.	**4x**
4	Simplify $\sqrt{48} + \sqrt{27}$.	**$7\sqrt{3}$**
5	Simplify $\sqrt{6} \cdot \sqrt{24}$.	**12**
6	Simplify $9/\sqrt{6}$. Rationalize the denominator.	**$3\sqrt{6}/2$**

PART 2 · APPLY IT

1. **$4\sqrt{2}$ cm** A square's side length is the square root of its area. Simplify $\sqrt{32}$ to get $4\sqrt{2}$ cm.
2. **$\sqrt{6}$ m** Simplify the lengths to $4\sqrt{6}$ m and $3\sqrt{6}$ m. Subtract to get $\sqrt{6}$ m.

CHALLENGE

$(\sqrt{18} + \sqrt{8})/\sqrt{12} = (3\sqrt{2} + 2\sqrt{2})/(2\sqrt{3}) = 5\sqrt{2}/(2\sqrt{3}) = 5\sqrt{6}/6$

Accept equivalent intermediate steps. Final answers should have no perfect square or cube factors left inside a root and no radical in a denominator.