

Radical Operation Lab

Simplify and combine numerical radicals.

HIGH SCHOOL • MA.912.NSO.1.4

MA.912.NSO.1.4 "Apply previous understanding of operations with rational numbers to add, subtract, multiply and divide numerical radicals."

NAME _____

DATE _____

WORK WITH RADICALS

First simplify each radical by pulling out perfect-square factors. Add or subtract only like radicals, multiply radicals by multiplying inside the square roots, and simplify fully after dividing.

WORKED EXAMPLE

Simplify: $\sqrt{48} / \sqrt{3}$

1. $\sqrt{48} / \sqrt{3} = \sqrt{48/3}$

2. $\sqrt{48/3} = \sqrt{16}$

3. $\sqrt{16} = 4$

Answer: 4

PRACTICE 6 problems

1 Simplify: $\sqrt{50} + \sqrt{8}$

ANSWER _____

2 Simplify: $\sqrt{98} - \sqrt{8}$

ANSWER _____

3 Simplify: $\sqrt{18} \cdot \sqrt{8}$

ANSWER _____

4 Simplify: $\sqrt{72} / \sqrt{2}$

ANSWER _____

5 Simplify: $(\sqrt{200} + \sqrt{8}) / \sqrt{2}$

ANSWER _____

6 Simplify: $\sqrt{75} / \sqrt{12}$

ANSWER _____

APPLY IT Show your work

- 1** For a gaming tournament, a student places two square screens side by side with no gap. One screen has a side length of $\sqrt{50}$ inches, and the other has a side length of $\sqrt{8}$ inches. What is the total width?

WORK SPACE

ANSWER _____

- 2** An animation club applies a scale factor of $\sqrt{18}$, then a scale factor of $\sqrt{8}$, to a logo. What is the overall scale factor?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Simplify completely. Write your answer with no radical in the denominator: $(\sqrt{176} + \sqrt{343}) / \sqrt{7}$

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Simplify: $\sqrt{50} + \sqrt{8}$	$7\sqrt{2}$
2	Simplify: $\sqrt{98} - \sqrt{8}$	$5\sqrt{2}$
3	Simplify: $\sqrt{18} \cdot \sqrt{8}$	12
4	Simplify: $\sqrt{72} / \sqrt{2}$	6
5	Simplify: $(\sqrt{200} + \sqrt{8}) / \sqrt{2}$	12
6	Simplify: $\sqrt{75} / \sqrt{12}$	$5/2$

PART 2 • APPLY IT

1. **$7\sqrt{2}$ inches** Simplify the two side lengths as $5\sqrt{2}$ and $2\sqrt{2}$, then add the like radicals.
2. **12** Multiply the radical scale factors: $\sqrt{18} \cdot \sqrt{8} = \sqrt{144} = 12$.

CHALLENGE

 $7 + 4\sqrt{77}/7$

Accept equivalent forms such as $(49 + 4\sqrt{77})/7$ for the challenge. Require simplified radicals and a rational denominator in final answers.