LESSON MAKER PRO

Radicals in Action

Simplify, combine, and rationalize square roots.

HIGH SCHOOL · A1.N.1.2

A1.N.1.2 "Add, subtract, multiply, divide, and simplify square roots of constants, rationalizing the denominator when necessary."

NAME _____ DATE _____

HOW RADICALS WORK

Factor out perfect squares to simplify a square root. Add or subtract square roots only after simplifying them, and combine only terms with the same number under the root. To divide by a square root, multiply the numerator and denominator by that root so the denominator is rational.

WORKED EXAMPLE

Simplify sqrt(147) + sqrt(48).

1. Factor out perfect squares: sqrt(147) = sqrt(49 × 3) and sqrt(48) = sqrt(16 × 3).
2. Simplify each root: 7sqrt(3) + 4sqrt(3).
3. Combine like radicals: (7 + 4)sqrt(3) = 11sqrt(3).

Answer: 11sqrt(3)

PRACTICE 6 problems

1 Simplify sqrt(200).

ANSWER _____

2 Simplify sqrt(50) + sqrt(8).

ANSWER _____

3 Simplify sqrt(125) - sqrt(20).

ANSWER _____

4 Simplify sqrt(6) × sqrt(15).

ANSWER _____

5 Simplify sqrt(80) / sqrt(5).

ANSWER _____

6 Simplify 5 / sqrt(6). Rationalize the denominator.

ANSWER _____

APPLY IT Show your work

1 On a bike ride, you travel sqrt(28) kilometers to a park and then sqrt(63) kilometers to a café. What is the total distance? Give an exact, simplified answer.

WORK SPACE

ANSWER _____

2 A music editor has a clip that lasts sqrt(96) seconds and trims it to sqrt(54) seconds. How many seconds were removed? Give an exact, simplified answer.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Simplify (sqrt(45) + sqrt(20)) / sqrt(6). Show how you combine the radicals and rationalize the denominator.

WORK SPACE AND ANSWER

ANSWER KEY

Radicals in Action

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Simplify sqrt(200).	**10sqrt(2)**
2	Simplify sqrt(50) + sqrt(8).	**7sqrt(2)**
3	Simplify sqrt(125) - sqrt(20).	**3sqrt(5)**
4	Simplify sqrt(6) × sqrt(15).	**3sqrt(10)**
5	Simplify sqrt(80) / sqrt(5).	**4**
6	Simplify 5 / sqrt(6). Rationalize the denominator.	**5sqrt(6)/6**

PART 2 · APPLY IT

1. **5sqrt(7) kilometers** Simplify the distances to 2sqrt(7) and 3sqrt(7) kilometers, then add them.
2. **sqrt(6) seconds** Subtract the trimmed length from the original length: 4sqrt(6) - 3sqrt(6) = sqrt(6) seconds.

CHALLENGE

(3sqrt(5) + 2sqrt(5))/sqrt(6) = 5sqrt(5)/sqrt(6) = 5sqrt(30)/6

Require simplified radicals and rational denominators. Accept equivalent exact forms that meet both requirements.