

R.7 – Radical Notation and Radical Exponents

Skills

- R.7a - Simplify radical expressions.
- R.7b - Perform operations(add/subtract) on radical expressions.
- R.7c - Perform operations(multiply/divide) on radical expressions.
- R.7d - Use the Pythagorean Theorem to find the missing side of a right triangle
- R.7e - Rationalize a denominator of a fraction that contains a radical.
- R.7f - Convert a radical expression to an exponential expression (and converse) involving/using rational exponents.
- R.7g - Convert various radical expressions to exponential expressions(and converse).

Introduction

Properties of Radicals

Let a and b be any real numbers or expressions for which the given roots exist. For any natural numbers m and n ($n \neq 1$):

1. If n is even, $\sqrt[n]{a^n} = |a|$.
2. If n is odd, $\sqrt[n]{a^n} = a$.
3. $\sqrt[n]{a} \cdot \sqrt[n]{b} = \sqrt[n]{ab}$.
4. $\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$ ($b \neq 0$).
5. $\sqrt[n]{a^m} = (\sqrt[n]{a})^m$.

Rational Exponents

For any real number a and any natural numbers m and n , $n \neq 1$, for which $\sqrt[n]{a}$ exists,

$$a^{1/n} = \sqrt[n]{a},$$
$$a^{m/n} = \sqrt[n]{a^m} = (\sqrt[n]{a})^m, \text{ and}$$
$$a^{-m/n} = \frac{1}{a^{m/n}}, \text{ } a \neq 0.$$

Example 1

11)

Example 2

19)

Example 3a

45)

Example 3b

51)

Example 4

59)

Example 5	65)
Example 6	85)
Example 7	87)
Example 8	97)
Example 9	107)

Example 10	117)
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R.7 - EXTRA PRACTICE

Extra Practice R.7a on p.50 #1-24 - Follow the instructions in the book and complete the problems.

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Extra Practice R.7b on p.50 #45-50 - Follow the instructions in the book and complete the problems.

Extra Practice R.7c on p.50 #25-34,35-44,51-58- Follow the instructions in the book and complete the problems.

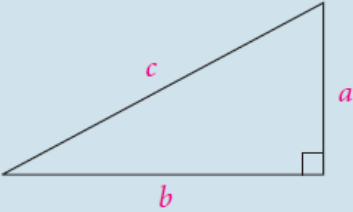
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Extra Practice R.7d on p.50 #59-64 - Follow the instructions in the book and complete the problems.

The Pythagorean Theorem

The sum of the squares of the lengths of the legs of a right triangle is equal to the square of the length of the hypotenuse:

$$a^2 + b^2 = c^2.$$


Extra Practice R.7e on p.50 #65-76 - Follow the instructions in the book and complete the problems.

Extra Practice R.7f on p.50 #87-96, 97-106- Follow the instructions in the book and complete the problems.

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Extra Practice R.7g on p.50 #107-116, 117-124 - Follow the instructions in the book and complete the problems.

R.7 - IXL PRACTICE

IXL - A1-EE.1 [Simplify radical expressions](#)

Date				Final
Grade				
Initials				

R.7a

IXL - A1-EE.2 [Simplify radical expressions with variables](#)

Date				Final
Grade				
Initials				

R.7a

IXL - A1-EE.3 [Simplify radical expressions involving fractions](#)

Date				Final
Grade				
Initials				

R.7a

IXL - A1-EE.5 [Add and subtract radical expressions](#)

Date				Final
Grade				
Initials				

R.7b

IXL - A1-EE.4 [Multiply radical expressions](#)

Date				Final
Grade				
Initials				

R.7c

IXL - A1-EE.7 [Simplify radical expressions using conjugates](#)

Date				Final
Grade				
Initials				

R.7e

IXL - A1-EE.9 [Convert between rational exponents and radicals](#)

Date				Final
Grade				
Initials				

R.7f

Closing Reflection: