



Objective: Simplifying Radicals

Homework RX1 – NYA p.619 #1 – 12, 72, 79

Do Now: Simplify

1. $2x + 5x$	2. $(9xy)(-4x)$	3. $-10y \cdot 5y^2 \cdot 3y$
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Exam Prep: Which of the following is equivalent to x^6 ? A) $x^2 \cdot x^3$ B) $x^4 \cdot x \cdot x$ C) $x^3 + x^3$ D) $(x^3)^3$ Rules for Simplifying Radicals

A radical is simplified when both of the following are true:

- The numbers *under* the radical sign (radicands) have no square *factors*
- The number of radical signs in the expressions is as small as possible

Hints

1. Look for *perfect square factors* in *numbers* and *variables*
2. Check your solution for simplest form using the rules



Numbers

Original	Factored	Simplified
$\sqrt{24}$	$\sqrt{4} \sqrt{6}$	$2\sqrt{6}$
$\sqrt{18}$	$\sqrt{9} \sqrt{2}$	$3\sqrt{2}$
$\sqrt{30}$	No Perfect Square Factors	$\sqrt{30}$
$\sqrt{48}$	$\sqrt{4} \sqrt{12}$ Best Choice?	$2\sqrt{12}$ NOT DONE
$2\sqrt{12}$	$2\sqrt{4}\sqrt{3} \rightarrow 2 \cdot 2\sqrt{3}$	$4\sqrt{3}$
$5\sqrt{18}$	$5 \sqrt{9} \sqrt{2}$	$5 \cdot 3\sqrt{2} \rightarrow 15\sqrt{2}$

Practice

1. $\sqrt{20}$	2. $6\sqrt{75}$	3. $2\sqrt{14}$
4. $6\sqrt{16}$	5. $\sqrt{32}$	6. $10\sqrt{19}$

Quick Refresh: Exponent Product Law

$$x^3 \bullet x^7 = x^{10}$$

Variables

Original	Original	Factored	Simplified
EVEN	$\sqrt{x^6}$	Perfect ☺	x^6
EVEN	$\sqrt{y^{14}}$	Perfect ☺	y^7
ODD	$\sqrt{z^9}$	$\sqrt{z^8} \sqrt{z} \leftarrow 1^{\text{st}} \text{ Power}$	$z^4 \sqrt{z}$
ODD	$\sqrt{k^{13}}$	$\sqrt{k^{12}} \sqrt{k}$	$k^6 \sqrt{k}$

Practice

1. $\sqrt{h^4}$	2. $\sqrt{x^{11}}$	3. $\sqrt{p^{20}}$
4. $\sqrt{c^{600}}$	5. $\sqrt{w^{43}}$	6. \sqrt{m}

Mixed Problem

$4\sqrt{12w^5xy^{10}z^3}$	Original
$4 \sqrt{4} \sqrt{3} \sqrt{w^4} \sqrt{w} \sqrt{x} \sqrt{y^{10}} \sqrt{z^2} \sqrt{z}$	Separate and Factor
$4 \bullet 2 \sqrt{3} \quad w^2 \sqrt{w} \sqrt{x} \quad y^5 \quad z \sqrt{z}$	Square Root
$8w^2y^5z \sqrt{3wxz}$	Organize

Mixed Practice

1. $5\sqrt{x^5y^{10}z}$	2. $\sqrt{100ab^7c^{20}d^8}$	3. $7\sqrt{18y^{10}z}$
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