

Quiz 5 Review Sheet

Calculators: Like last time, no calculators will be allowed on the quiz.

Practice Problems

1. Simplify the following radical expressions:

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|--|--|
| (a) $\sqrt[2]{16y^8}$ | (b) $\sqrt[3]{16y^8}$ |
| (c) $\sqrt[3]{-16y^8}$ | (d) $\sqrt[2]{-16}$ |
| (e) $\sqrt{15xy} \cdot \sqrt{5x^4y^9}$ | (f) $\sqrt[5]{-3 \cdot (y-1)^2} \cdot \sqrt[5]{(y-1)^6}$ |
| (g) $\sqrt{\frac{100}{49}}$ | (h) $\sqrt{\frac{100x^3y}{49xy^3}}$ |

2. Solve these radical equations, and check your answers. (*Note: always check in the original equation*)

- | | |
|------------------------------------|-------------------------------------|
| (a) $\sqrt{3x} = 4$ | (b) $\sqrt{3+x} + 4 = 9$ |
| (c) $\sqrt[3]{4x+7} = -1$ | (d) $\sqrt[5]{7-x} = \sqrt[5]{x-8}$ |
| (e) $4 \cdot \sqrt[3]{x} + 7 = -1$ | (f) $2\sqrt{x+5} - 2 = 4$ |

3. Solve the following equations. Check your answers.

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|-----------------------------|---------------------------|
| (a) $ 7-x = 3$ | (b) $x^2 + 1 = 65$ |
| (c) $(x+1)^2 = 4$ | (d) $x^3 + 1 = 65$ |
| (e) $3(x-2)^2 - 13 = -1$ | (f) $6 - 2 x+9 = 3$ |
| (g) $\sqrt[3]{x^3-16} = -2$ | (h) $\sqrt{7+(3x)^2} = 4$ |

Terms

➤ *Simplifying* means:

- * Combine as many roots as possible
- * Take as much as you can from under the root

Quick Facts

➤ Imaginary numbers appear when you have a root with an *even* index and a negative number inside:

$\sqrt[2]{-1}$ imaginary	$\sqrt[2]{1}$ not imaginary
$\sqrt[3]{-1}$ not imaginary	$\sqrt[3]{1}$ not imaginary

➤ You use absolute value signs only when *taking variables out of a root with even index*:

$\sqrt{x \cdot x \cdot x} = x \cdot \sqrt{x}$	$\sqrt[2]{q^7} = q ^3 \cdot \sqrt{q}$
$\sqrt[3]{x \cdot x \cdot x \cdot x} = x \cdot \sqrt[3]{x}$	$\sqrt[3]{q^7} = q^2 \cdot \sqrt[3]{q}$

Here's the table from class with the different combinations of indexes and radicands:

$\sqrt[\text{even}]{\text{positive}} = \text{positive}$	$\sqrt[\text{odd}]{\text{positive}} = \text{positive}$
$\sqrt[\text{even}]{\text{negative}} = \textbf{imaginary}$	$\sqrt[\text{odd}]{\text{negative}} = \text{negative}$

Selected answers: **1.** (a) $4|y|^4$ (c) $2y^2 \cdot \sqrt[3]{-2y^2}$ (e) $5|x|^2|y|^5\sqrt{3x}$ (h) $\frac{10}{7}\sqrt{\frac{x}{y}}$

2. (a) $x = -\frac{16}{3}$ and $x = +\frac{16}{3}$ (c) $x = -2$ (e) $x = -8$

3. (a) $x = 4$ and $x = 10$ (c) $x = 1$ and $x = -3$ (e) $x = 0$ and $x = 4$ (g) $x = 2$