

LESSON
8-6 Practice A
Radical Expressions and Rational Exponents

Answer each question. The first one is done for you.

1. List all of the square roots of 36. 6 and -6

2. What is the inverse of the square of a number?

3. Express $n^{\frac{1}{2}}$ without a fractional exponent.

4. Express $n^{\frac{7}{4}}$ without a fractional exponent.

5. Write the following root: the radicand is 10 and the index is 12.

Find all real roots. The first one is done for you.

6. 4th roots of 1 7. cube roots of 27 8. square roots of 81
- $\sqrt[4]{1} = \sqrt[2]{\sqrt{1}} = \sqrt{1} = \pm 1$ _____

Write each expression in radical form, and simplify. The first one is done for you.

9. $6^{\frac{1}{2}}$ 10. $8^{\frac{2}{3}}$ 11. $5^{\frac{4}{3}}$
- $6^{\frac{1}{2}} = \sqrt[2]{6^1} = \sqrt{6}$ _____

Write each expression by using rational exponents. The first one is done for you.

12. $\sqrt{7^2}$ 13. $\sqrt[4]{5^3}$ 14. $\sqrt[3]{10^5}$
- $\sqrt{7^2} = 7^{\frac{2}{2}} = 7^1 = 7$ _____

Simplify each expression. Assume all variables are positive.

15. $\sqrt[3]{8x^3}$ 16. $\sqrt{\frac{36}{16}}$ 17. $2^2 \cdot 2^3$
 18. $\frac{(3x)^4}{(3x)^2}$ 19. $(5^2)^2$ 20. $\left(\frac{8x^3}{27}\right)^{\frac{1}{3}}$
- _____

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Answer each question. The first one is done for you.

- List all of the square roots of 36.
- What is the inverse of the square of a number?
- Express $n^{\frac{1}{2}}$ without a fractional exponent.
- Express $n^{\frac{7}{4}}$ without a fractional exponent.
- Write the following root: the radicand is 10 and the index is 12.

6 and -6

The square root

\sqrt{n}

$\sqrt[4]{n^7}$

$\sqrt[12]{10}$

Find all real roots. The first one is done for you.

- 4th roots of 1
- cube roots of 27
- square roots of 81

$\sqrt[4]{1} = \sqrt[2]{\sqrt{1}} = \sqrt{1} = \pm 1$ **3** **± 9**

Write each expression in radical form, and simplify. The first one is done for you.

- $6^{\frac{1}{2}}$
- $8^{\frac{2}{3}}$
- $5^{\frac{4}{3}}$

$6^{\frac{1}{2}} = \sqrt[2]{6^1} = \sqrt{6}$ $\sqrt[3]{8^2} = 4$ $\sqrt[3]{5^4}$

Write each expression by using rational exponents. The first one is done for you.

- $\sqrt{7^2}$
- $\sqrt[4]{5^3}$
- $\sqrt[3]{10^5}$

$\sqrt[2]{7^2} = 7^{\frac{2}{2}} = 7^1 = 7$ $5^{\frac{3}{4}}$ $10^{\frac{5}{3}}$

Simplify each expression. Assume all variables are positive.

- $\sqrt[3]{8x^3}$
- $\sqrt{\frac{36}{16}}$
- $2^2 \cdot 2^3$

$2x$ **$\frac{3}{2}$** **2^5 or 32**

- $\frac{(3x)^4}{(3x)^2}$
- $(5^2)^2$
- $\left(\frac{8x^3}{27}\right)^{\frac{1}{3}}$

$9x^2$ **5^4 or 625** **$\frac{2x}{3}$**
