

January 13th

Due Today: 6.5 HW

Unit 6: Exponents and Radicals

Lesson 6.6: Quiz + Radials with Variables

Get Ready: Check your HW:

- 1) 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225
- | | | | |
|-------------------|-------------------|---|------------------|
| 2) $2\sqrt{5}$ | 3) $5\sqrt{5}$ | 4) 6 | 5) $\sqrt{30}$ |
| 6) $20\sqrt{5}$ | 7) $30\sqrt{7}$ | 8) $-14\sqrt{2}$ | 9) $-10\sqrt{5}$ |
| 10) $182\sqrt{6}$ | 11) $-40\sqrt{6}$ | 12) 1.5, $\sqrt{3}$, 2, $\sqrt{7}$, $2\sqrt{2}$, $3\sqrt{5}$ | |

$$\begin{array}{l} \textcircled{a} \quad -5\sqrt{20} \\ \quad \quad \downarrow \quad \swarrow \\ \quad \quad \sqrt{4} \quad \sqrt{5} \\ \quad \quad \downarrow \\ -5 \cdot 2 \quad \sqrt{5} \\ \boxed{-10\sqrt{5}} \end{array}$$

$$\begin{array}{l} \textcircled{8} \quad -\sqrt{392} \\ \quad \quad \downarrow \\ \quad \quad \sqrt{196} \quad \sqrt{2} \\ \quad \quad \downarrow \\ \boxed{-14\sqrt{2}} \end{array}$$

(10) $14\sqrt{1014}$

$\sqrt{169} \quad \sqrt{6}$

$\downarrow \quad \downarrow$

$14 \cdot 13 \sqrt{6}$

$182\sqrt{6}$

(11) $-10\sqrt{96}$

$\sqrt{16} \quad \sqrt{4}$

$\downarrow \quad \downarrow$

$-10 \cdot 4 \sqrt{6}$

$-40\sqrt{6}$



QUIZ

Algebra 1

Name _____

Mini Quiz 6.6 Radicals Mastery: _____

Date _____ Algebra _____

Simplify.

$$1) \sqrt{150} \quad \sqrt{25}\sqrt{6}$$

$$\quad \quad \quad \textcircled{5\sqrt{6}}$$

$$2) \sqrt{63} \quad \sqrt{9}\sqrt{7}$$

$$\quad \quad \quad \textcircled{3\sqrt{7}}$$

$$3) 2\sqrt{32} = 2\sqrt{16}\sqrt{2}$$

$$\quad \quad \quad 2 \cdot 4\sqrt{2}$$

$$\quad \quad \quad \textcircled{8\sqrt{2}}$$

$$4) 3\sqrt{196} = 14$$

$$\quad \quad \quad 3 \cdot 4 = \textcircled{42}$$

$$5) \textcircled{6\sqrt{42}}$$

$$6) -5\sqrt{80} = \sqrt{16}\sqrt{5}$$

$$\quad \quad \quad = 4\sqrt{5}$$

$$\quad \quad \quad \textcircled{-20\sqrt{5}}$$

Let's think back to exponent laws...

$$5 * 5 = \underline{25} \text{ and } \sqrt{25} = \underline{5}$$

SO...

$$x^5 * x^5 = \underline{x^{10}} \text{ and } \sqrt{x^{10}} = \underline{x^5}$$

$$\sqrt{x} = x^{1/2}$$

$$\sqrt{x^{10}} = (x^{10})^{1/2}$$

$$= x^5$$

RADICALS WITH VARIABLES

IF THE EXPONENT IS EVEN

$$\begin{aligned}\sqrt{a^6} &= \sqrt{a^3 * a^3} \\ &= a^3\end{aligned}$$

$$\sqrt{b^{18}} = b^9$$

$$\sqrt{c^{20}} = c^{10}$$

RULE: If the exponent is EVEN then the square root exponent is HALF of the original exponent:

IF THE EXPONENT IS ODD

$$\begin{aligned}\sqrt{a^7} &= \sqrt{a^6 * a} \\ &= a^3 * \sqrt{a} \\ &= a^3\sqrt{a}\end{aligned}$$

$$\sqrt{b^9} = b^4\sqrt{b}$$

$$\sqrt{c^{31}} = c^{15}\sqrt{c}$$

RULE: If the exponent is ODD then the square root exponent is half of the original exponent PLUS one variable left over UNDER the radical!

Examples:

$$\sqrt{28p^{12}}$$

$$\begin{array}{c} \swarrow \quad \searrow \\ \sqrt{4} \quad \sqrt{7} \\ 2\sqrt{7} \quad p^6 \end{array}$$

$$\boxed{2p^6\sqrt{7}}$$

$$\sqrt{72w^5}$$

$$\begin{array}{c} \swarrow \quad \searrow \\ \sqrt{36} \quad \sqrt{2} \quad \sqrt{w^4} \quad \sqrt{w} \\ 6\sqrt{2} \cdot w^2\sqrt{w} \end{array}$$

$$\boxed{6w^2\sqrt{2w}}$$

$$\sqrt{80x^2y^9z^6}$$

$$\begin{array}{c} \swarrow \quad \searrow \\ \sqrt{16} \quad \sqrt{5} \quad \sqrt{y^8} \quad \sqrt{y} \\ 4 \quad \sqrt{5} \cdot x \cdot y^4 \sqrt{y} \cdot z^3 \end{array}$$

$$\boxed{4xy^4z^3\sqrt{5y}}$$

Practice:

1) $\sqrt{a^4b^6} = \boxed{a^2b^3}$

2) $\sqrt{x^3y^6} = \boxed{xy^3\sqrt{x}}$

1) $\sqrt{12n^6} = \boxed{2n^3\sqrt{3}}$
 $\sqrt{4} \quad \sqrt{3} \quad \downarrow n^3$
 $2\sqrt{3}$

2) $\sqrt{72n^9} = \boxed{6n^4\sqrt{2n}}$
 $\sqrt{36} \quad \sqrt{2} \quad \sqrt{n^8} \quad \sqrt{n}$
 $6\sqrt{2} \quad n^4\sqrt{n}$

3) $-5\sqrt{108n^3} = \boxed{-30n\sqrt{3n}}$
 $\sqrt{36} \quad \sqrt{3} \quad \sqrt{n^2} \quad \sqrt{n}$
 $-5 \cdot 6\sqrt{3} \cdot n \cdot \sqrt{n}$

4) $-4\sqrt{50n^{10}}$

5) $\sqrt{12x^5y^2}$

6) $\sqrt{64x^2y^2}$

7) $2\sqrt{27uv^2}$

8) $-5\sqrt{50u^5v}$

9) $4\sqrt{20x^4yz^2}$

10) $5\sqrt{18m^2n^6p^3}$

1) $\sqrt{12n^6}$

$2n^3\sqrt{3}$

2) $\sqrt{72n^9}$

$6n^4\sqrt{2n}$

3) $-5\sqrt{108n^3}$

$-30n\sqrt{3n}$

4) $-4\sqrt{50n^{10}}$

$-20n^5\sqrt{2}$

5) $\sqrt{12x^5y^2}$

$2x^2y\sqrt{3x}$

6) $\sqrt{64x^2y^2}$

$8xy$

7) $2\sqrt{27uv^2}$

$6v\sqrt{3u}$

8) $-5\sqrt{50u^5v}$

$-25u^2\sqrt{2uv}$

9) $4\sqrt{20x^4yz^2}$

$8x^2z\sqrt{5y}$

10) $5\sqrt{18m^2n^6p^3}$

$15m^3p\sqrt{2np}$

Unit 6: Exponents and Radicals

Lesson #	Name	Recap	HW
6.1	Review of basic Exponent Laws		HW 6.1 *unit 5 corrections
6.2	Challenge Practice		HW 6.2
6.3	Exponential Growth and Decay		HW 6.3
6.4	Simplifying Radicals		6.4 VN 6.4 Delta Math
6.5	More Radicals		HW 6.5 QUIZ WED!
6.6	Quiz + Radicals with variables		HW 6.6