Simplifying Radical Expressions (Lesson 10-2)

- A. Square _____ is one of two equal factors of a
- A number whose square root is a <u>integer</u> number is called a
- The positive square root is called the principal
- Every positive number has <u>2</u> square roots. (One <u>positive</u> and one negative)
- √ is called a <u>radical</u> <u>sign</u>. It represents the principal square root unless there is a negative sign in front of the radical or a \pm in front of the radical.

Examples: $\sqrt{\frac{16}{9}} = \frac{+4}{3}$

B. $\sqrt{0.0144} = 0.12$

C. $\sqrt{\frac{64}{25}} = \frac{8}{5}$

D. $\sqrt{0.36} = 0.6$

Note: Most square roots are <u>irrational</u> <u>numbers</u> because they are neither a repeating nor a terminating decimal.

- A radical expression is an expression that contains a Square root. or cube root
 A radicand is the expression under the radical sign.
- · The <u>index</u> is the number telling what Kind of root (square / cube, ect.) you are finding.

Simplifying Square Roots

Factor, pull out pairs of like factors.

E.
$$\sqrt{52} = \sqrt{2.3.13}$$

F.
$$\sqrt{72} = \sqrt{2 \cdot 2 \cdot 2 \cdot 3 \cdot 3}$$

$$= 2 \cdot 3 \sqrt{2}$$

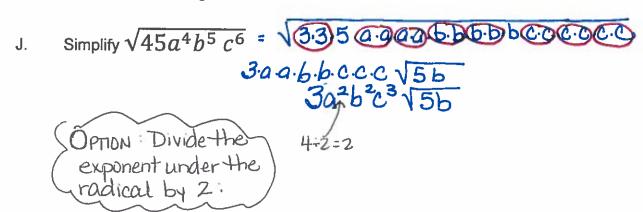
$$= 6 \sqrt{2}$$

Simplify:

H.
$$\sqrt{45} = \sqrt{8.3.5}$$
 1. $\sqrt{60} = \sqrt{2.23.5}$ $2\sqrt{3.5} = 2\sqrt{15}$

Simplify a Square Root with Variations

IMPORTANT NOTE: For radical expressions where the exponent of the variable inside the radical is *even* and the resulting simplified exponent is odd, you must use absolute value to guarantee nonnegative results.



Simplifying Radical Expressions (Lesson 10-2)

Simplify $\sqrt{32m^2n^3c^4} = \sqrt{2\cdot 2\cdot 2\cdot 2\cdot 2\cdot m^2n^2n^2}$ K. 2.2.m.r.c2 V2n 4 mne Van

[Rull out groups of 3 identical factors] Negative numbers have negative

L.
$$\sqrt[3]{-8} = \sqrt[3]{-2(-2)(-2)}$$

M.
$$\sqrt[3]{a^6b^9} = \sqrt[3]{6^3}6^36^36^3$$

N.
$$\sqrt[3]{c^7 d^{14}} = \sqrt[3]{c^2 d^{12} d^2}$$

$$= c^2 d^4 \sqrt[3]{c d^2}$$

P.
$$\sqrt[3]{54a^4b^6c^5} = \sqrt[3]{a6\cdot 3\cdot 36\cdot 3a\cdot 6\cdot 6\cdot 6\cdot 2^2}$$

 $3ab^2c\sqrt[3]{aac^2}$

PRACTICE PROBLEMS: Simplify each radical expression

1.
$$\sqrt{250 n^5}$$

2.
$$\sqrt{25 x^3 y^4}$$

3.
$$\sqrt{216 \, v^3}$$

4.
$$\sqrt{72x y^6}$$

5.
$$\sqrt{600 \, w^{11}}$$

6.
$$\sqrt{162x^4y^7}$$

7.
$$\sqrt{20 \, k^6}$$

Simplifying Radical Expressions (Lesson 10-2)

8. $\sqrt{64h^9k^4}$

9. $\sqrt{1000n^8}$

10. $\sqrt{196m^2}$

- 11. $\sqrt[3]{5000b^7}$
- 12. $\sqrt[3]{27g^2}$
- 13. $\sqrt[3]{1000n^8}$

14. $\sqrt[3]{64h^9k^4}$