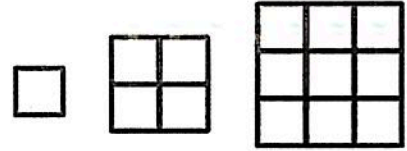


Essential Question: How do we simplify square and cube root radicals?

Do Now:

a) List the set of perfect square numbers from 1 to 225.

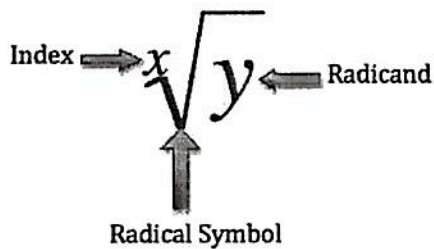


b) Which of the following expressions are perfect squares? x^2 x^5 x^8 x^9

c) Which of the following expressions are perfect cubes? x^2 x^3 x^6 x^9

Radical Expressions

An expression that uses a root, such as square root, cube root, etc...



Example:

$${}^4\sqrt{625}$$

If the _____ is not written, it is automatically a _____.

Simplifying Square Root Radicals



Question: What does it mean to "simplify"?

Think about the rational number $\frac{4}{8}$. Simplified, $\frac{4}{8}$ becomes $\frac{1}{2}$.

Question: Is there a way to "simplify" square root expressions that are irrational (non-perfect squares)?

- Find two factors of the radicand, one of which is a *perfect square*
- Express the square root of the product as the product of the square roots of the factors ($\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$)
- Find the square root of the factor that is the perfect square.

Examples: (a) $\sqrt{27}$

(b) $3\sqrt{75}$

What if we have a Cube Root Radical?

Examples: (c) $\sqrt[3]{27}$ (d) $\sqrt[3]{54}$

Let's try simplifying these radical expressions.

1. $\sqrt{8}$

2. $\sqrt{54}$

3. $\sqrt[3]{24}$

4. $\sqrt{\frac{16}{49}}$

5. $\sqrt{300}$

6. $2\sqrt{20}$

7. $2\sqrt{3}$

8. $\frac{1}{4}\sqrt{96}$

9. $\sqrt{49x^4}$

10. $\sqrt{8x^9}$

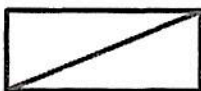
11. $2\sqrt{3x^3y^7}$

12. $-2\sqrt{36x^2y}$

13. $\sqrt{\frac{18}{81}}$

14. $\sqrt[3]{250w^7}$

15. A rectangle has dimensions of 6 feet by 36 inches. What is the length of the diagonal of the rectangle? Express your answer in simplest radical form.



TAKE AWAY

Some irrational numbers are expressed in radical form. These radical expressions can be simplified if the radicand can be factored into two numbers, one of which is a

_____ or _____.