Name _____ Date _____

Do Now:
Compute each of the following squares and square roots:

1^2 2^2 3^2 4^2 5^2 6^2 7^2 8^2 9^2 10^2 11^2 12^2 13^2

$\sqrt{1}$ $\sqrt{4}$ $\sqrt{9}$ $\sqrt{16}$ $\sqrt{25}$ $\sqrt{36}$ $\sqrt{49}$ $\sqrt{64}$ $\sqrt{81}$ $\sqrt{100}$ $\sqrt{121}$ $\sqrt{144}$ $\sqrt{169}$

Notation:
Square root or radical notation: $\sqrt[\text{index}]{\text{radicand}}$

Simplifying Radicals
Method 1: Prime Factorization

1) If the radicand is not a perfect square number, find the prime factorization of the radicand.
    a. Factor tree, or list out the prime numbers that multiply out to the radicand
2) Since the index of a square root is 2, if we have pairs of a factor, then that factor can move outside the radical
3) The numbers without a pair, will remain under the radical.
4) Multiply all factors outside the radical. Then multiply the numbers inside the radical.

Ex1) $\sqrt{252}$

Step 1) Prime factorization:

Step 2) Since this is the square root, we want to pair up factors:

Step 3) Move the paired factors outside the radical:

Step 4) Simplify both inside and outside the radical by multiplying:

Method 2: Perfect Square Numbers as Factors of the Radicand

1) Find the largest perfect square number that will evenly divide into the radicand. Take that number and take the square root of it and place it outside the radical
2) Repeat again until the radicand can no longer be divided by a perfect square.

Ex2) $\sqrt{108}$

What perfect square number can divide evenly into 108?

Examples

Ex3) $\sqrt{128}$ Ex4) $\sqrt{27}$ Ex5) $3\sqrt{125}$ Ex6) $\sqrt{33}$

Extra Practice

Simplify using whichever method you prefer. Show all work for credit.

1) $\sqrt{512}$

2) $2\sqrt{98}$

3) $\sqrt{224}$

4) $3\sqrt{162}$

5) $7\sqrt{16}$

6) $4\sqrt{71}$

7) $\sqrt{448}$

8) $5\sqrt{56}$

9) $\sqrt{216}$

10) $3\sqrt{80}$

11) $\sqrt{147}$

12) $\sqrt{200}$

13) $9\sqrt{45}$

14) $\sqrt{288}$

15) $\sqrt{196}$

16) $\sqrt{113}$