

Perfect Squares and Square Roots

What is a Perfect Square

- ▶ A perfect square is a number produced by multiplying the same number by itself.

Examples:

$$\blacktriangleright 1^2 = 1 \times 1 = 1$$

$$\blacktriangleright 4^2 = 4 \times 4 = 16$$

$$\blacktriangleright 2^2 = 2 \times 2 = 4$$

$$\blacktriangleright 5^2 = 5 \times 5 = 25$$

$$\blacktriangleright 3^2 = 3 \times 3 = 9$$

$$\blacktriangleright 6^2 = 6 \times 6 = 36$$

Exponential Form

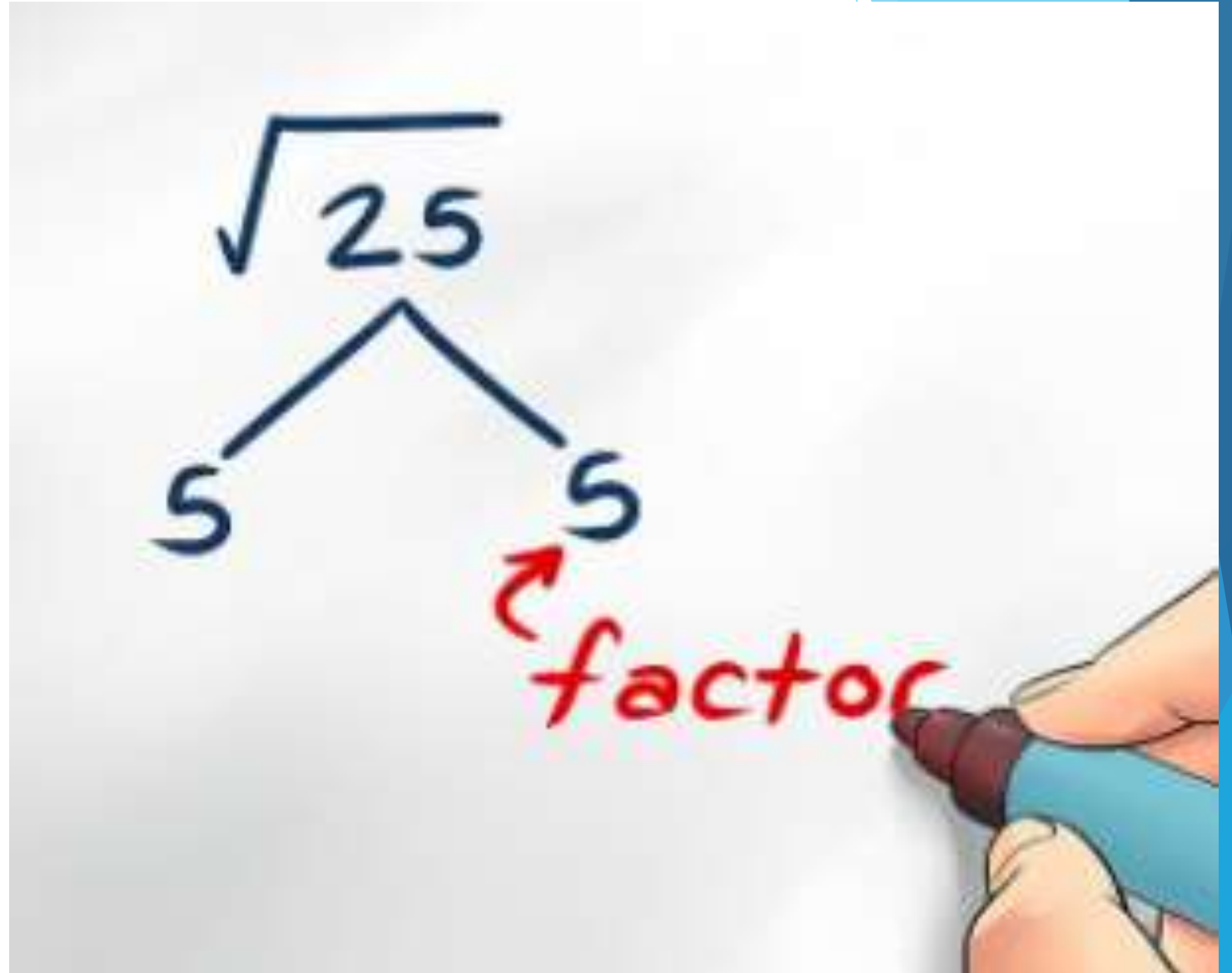
- ▶ Exponential form takes the number and uses a subscript to represent how many times we multiply the number by itself.
- ▶ Example
 - ▶ $2 \times 2 = 2^2$

Square Roots

- ▶ Square roots can never be of a negative number
- ▶ Square roots represented in exponential form and as a perfect square
 - ▶ $100 = 10^2$
 - ▶ $\sqrt{100} = 10$

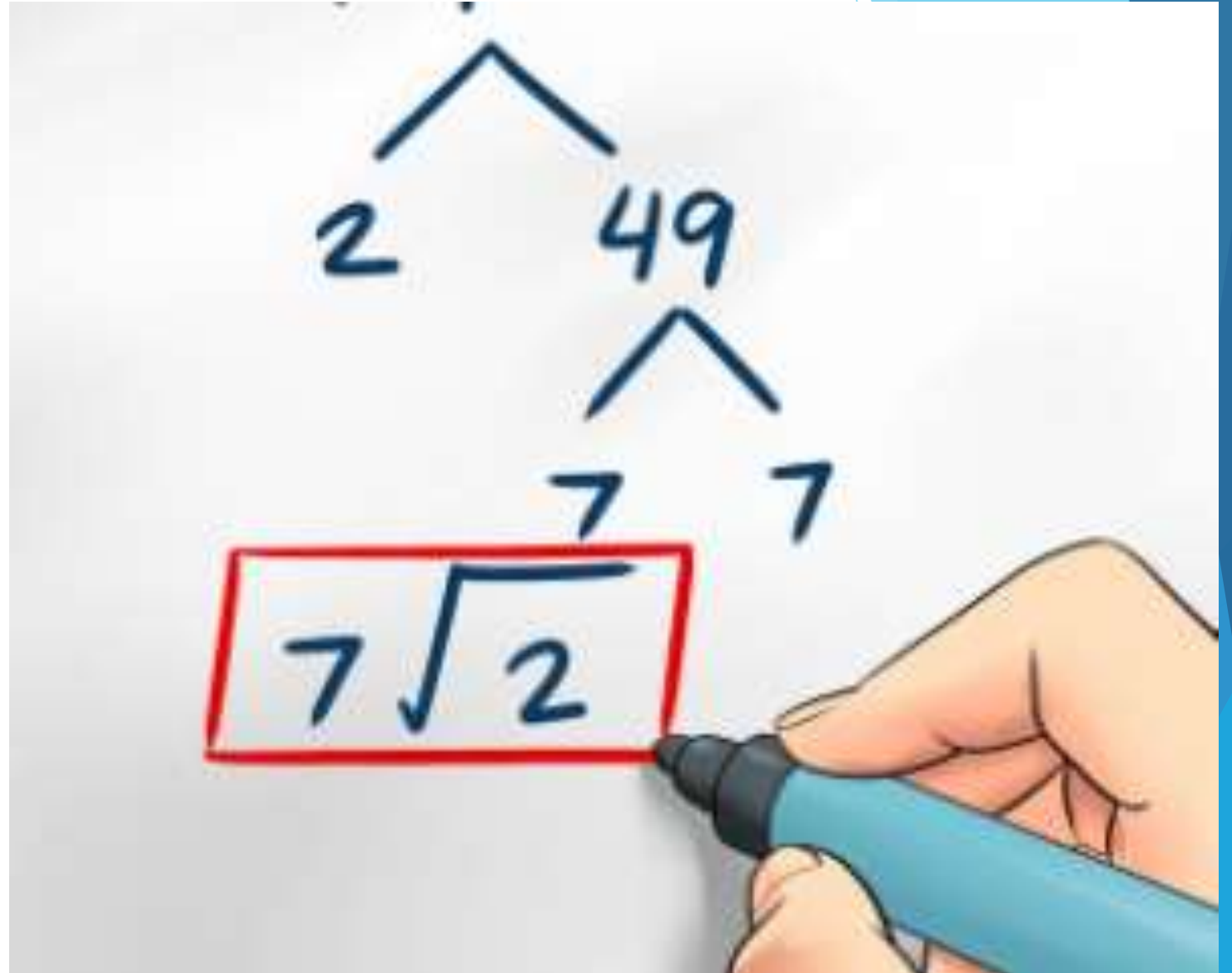
Factoring to determine the answer to a square root

- ▶ This is an example of a perfect square, so the two factors are identical

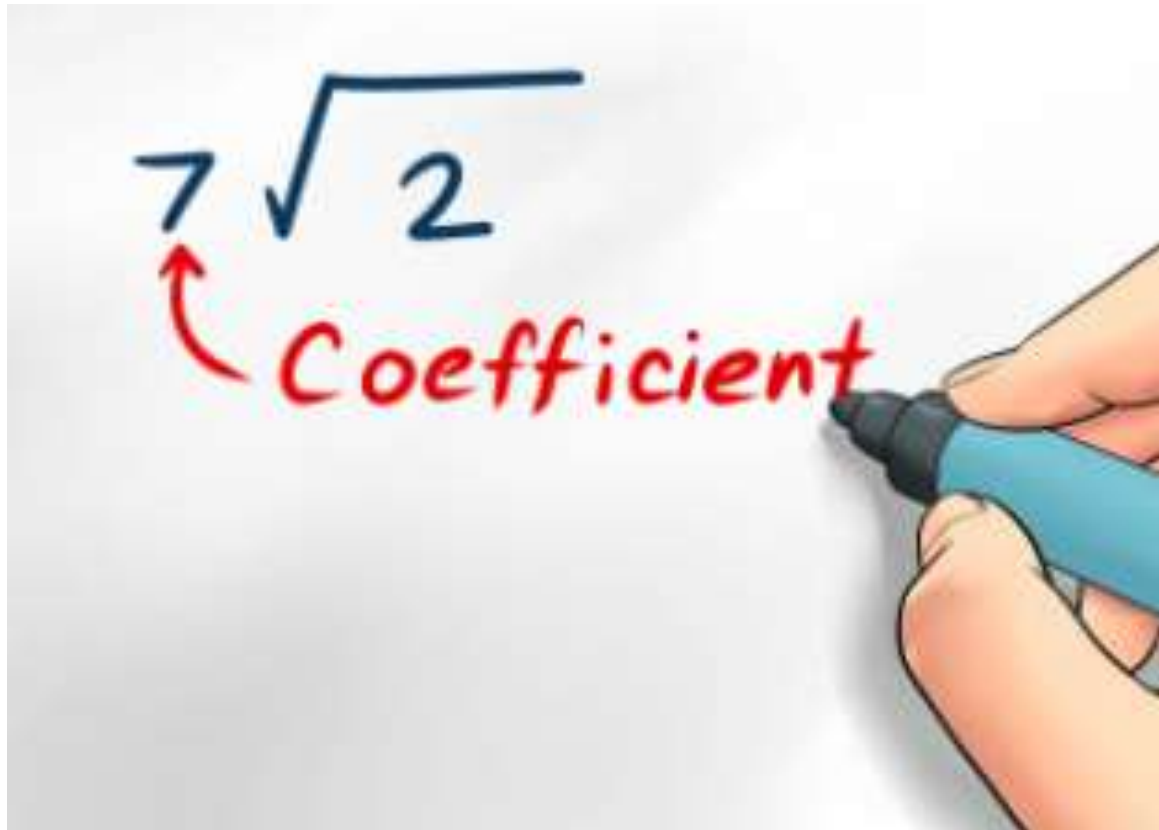


What happens when we have a imperfect square

- ▶ There will be a coefficient
- ▶ Can you identify the coefficient?



The coefficient is in front of the root



Simplify Square Roots

Find Perfect Square

$$\begin{aligned}\sqrt{48} &= \sqrt{16} \times \sqrt{3} \\ &= 4 \times \sqrt{3} \\ &= 4\sqrt{3}\end{aligned}$$

Find Prime Factors

$$\begin{aligned}\sqrt{48} &= \sqrt{2 \times 2 \times 2 \times 2 \times 3} \\ &= \sqrt{2 \times 2} \times \sqrt{2 \times 2} \times \sqrt{3} \\ &= 2 \times 2 \times \sqrt{3} \\ &= 4 \times \sqrt{3} \\ &= 4\sqrt{3}\end{aligned}$$

Examples and Practice

- ▶ Page 29 Activities
- ▶ Page 30 Examples 1 and 2
- ▶ Page 31 Practice # 1 to 26 (evens), 27, 29 and 31