perplexity

adding two sqrt

Adding two square roots can be straightforward or more complex depending on the values inside the square roots. Here's how to approach it:

General Steps for Adding Square Roots

Step 1: Identify the Square Roots

Let's say you want to add two square roots:

$$\sqrt{a} + \sqrt{b}$$

Step 2: Simplify if Possible

If the numbers under the square roots can be simplified (for example, if they have a common factor), do so first. For instance:

$$\sqrt{8} + \sqrt{2} = \sqrt{4 \times 2} + \sqrt{2} = 2\sqrt{2} + \sqrt{2} = 3\sqrt{2}$$

Step 3: Combine Like Terms

If both square roots are already in their simplest forms and cannot be combined further, you simply write them together:

$$\sqrt{a} + \sqrt{b}$$

This expression cannot be simplified further unless a and b are perfect squares or share a common factor.

Example Problems

Example 1: Simple Addition

Add:

$$\sqrt{9} + \sqrt{16}$$

Solution:

1. Calculate the square roots:

- $\sqrt{9} = 3$
- $\sqrt{16} = 4$

2. Add them together:

$$3 + 4 = 7$$

Example 2: Addition with No Common Factors

Add:

$$\sqrt{5} + \sqrt{20}$$

Solution:

1. Simplify $\sqrt{20}$:

$$\sqrt{20} = \sqrt{4 \times 5} = 2\sqrt{5}$$

2. Substitute back into the expression:

$$\sqrt{5} + 2\sqrt{5} = (1 + 2)\sqrt{5} = 3\sqrt{5}$$

Example 3: Addition of Different Square Roots

Add:

$$\sqrt{2} + \sqrt{3}$$

Solution:
Since there are no common factors and they cannot be simplified further, the result remains:

$$\sqrt{2} + \sqrt{3}$$

Conclusion

When adding square roots, always look for opportunities to simplify first. If they cannot be combined, express them as they are. This method will help you handle various cases effectively!