

Are the following equal? Justify your answers.

1. Does  $\sqrt{9} + \sqrt{16} = \sqrt{25}$  ?

2. Does  $\sqrt{3} + \sqrt{4} = \sqrt{7}$  ?

3. Does  $4\sqrt{3} + \sqrt{3} = 5\sqrt{3}$  ?

4. Does  $5\sqrt{2} \cdot 3\sqrt{2} = 2\sqrt{2}$  ?

5. Does  $6\sqrt{3} + 2\sqrt{2} = 8\sqrt{5}$  ?

State a rule in your own words:
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Now using this rule, complete the following problems. Remember to simplify radicals, if possible, before adding.

6.  $3\sqrt{2} + 5\sqrt{2} =$

9.  $\sqrt{75} \cdot 2\sqrt{3} =$

7.  $8\sqrt{3} + 4\sqrt{3} =$

10.  $\sqrt{18} + \sqrt{50} =$

8.  $\sqrt{63} \cdot 2\sqrt{7} =$

11.  $6\sqrt{3} + \sqrt{45} =$

Let's look at dividing radicals:

Example 1:  $\frac{\sqrt{6}}{\sqrt{2}} = \sqrt{3}$

Example 2:  $\frac{8\sqrt{10}}{2} = 4\sqrt{10}$

Example 3:  $\frac{10}{\sqrt{2}} = \frac{10}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{10\sqrt{2}}{\sqrt{2} \cdot \sqrt{2}} = \frac{10\sqrt{2}}{\sqrt{4}} = \frac{10\sqrt{2}}{2} = 5\sqrt{2}$

Note: mathematicians never leave the radical in the denominator. This procedure is called rationalizing the denominator.

Simplify the following:

12.  $\frac{\sqrt{10}}{\sqrt{2}}$

13.  $\frac{14}{\sqrt{2}}$

14.  $\frac{6\sqrt{3}}{3}$

15.  $\frac{18}{\sqrt{3}}$