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11-7 Adding and Subtracting Radical Expression.....#

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**Objective**

Add and subtract radical expressions.

Mar 6-10:01 AM

Square-root expressions with the same radicand are examples of **like radicals**.  $2a + 5a = 7a$

Like Radicals	$2\sqrt{5}$ and $4\sqrt{5}$	$6\sqrt{x}$ and $-2\sqrt{x}$	$3\sqrt{4t}$ and $\sqrt{4t}$
Unlike Radicals	2 and $\sqrt{15}$	$6\sqrt{x}$ and $\sqrt{6x}$	$3\sqrt{2}$ and $2\sqrt{3}$

$2 + \sqrt{15}$      $6\sqrt{x} + \sqrt{6x}$      $3\sqrt{2} + 2\sqrt{3}$

Like radicals can be combined by adding or subtracting. You can use the Distributive Property to show how this is done:

$$\underline{2}\sqrt{5} + \underline{4}\sqrt{5} = (2 + 4)\sqrt{5} = 6\sqrt{5}$$

$$6\sqrt{x} - \underline{2}\sqrt{x} = (6 - 2)\sqrt{x} = 4\sqrt{x}$$

Notice that you can combine like radicals by adding or subtracting the numbers multiplied by the radical and keeping the radical the same.

Apr 4-9:51 AM

**Helpful Hint**  
Combining like radicals is similar to combining like terms.  
 $2\sqrt{5} + 4\sqrt{5} = 6\sqrt{5}$   
 $2x + 4x = 6x$

**Add or subtract.**

A.  $9\sqrt{3} - 4\sqrt{3} = 5\sqrt{3}$     B.  $6\sqrt{x} + 6\sqrt{y}$   
 $ba + 6b$

C.  $\sqrt{m} - 7\sqrt{m}$     D.  $2\sqrt{xy} + 2\sqrt{y} + 9\sqrt{xy}$   
 $-6\sqrt{m}$      $11\sqrt{xy} + 2\sqrt{y}$

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How do you know which terms can be combined?

Sometimes radicals do not appear to be like until they are simplified. Simplify all radicals in an expression before trying to identify like radicals.

**Simplify each expression.**

1)  $\sqrt{45} - \sqrt{20}$   
 $\sqrt{9 \cdot 5} - \sqrt{4 \cdot 5}$   
 $3\sqrt{5} - 2\sqrt{5}$   
 $\sqrt{5}$

2)  $4\sqrt{27} - \sqrt{18}$   
 $4\sqrt{9 \cdot 3} - \sqrt{9 \cdot 2}$   
 $4 \cdot 3 - \sqrt{18}$   
 $12\sqrt{3} - 3\sqrt{2}$

3)  $9\sqrt{75} + 2\sqrt{50}$   
 $9\sqrt{25 \cdot 3} + 2\sqrt{25 \cdot 2}$   
 $9 \cdot 5\sqrt{3} + 2 \cdot 5\sqrt{2}$   
 $45\sqrt{3} + 10\sqrt{2}$

4)  $\sqrt{75y} - 2\sqrt{27y} + \sqrt{48y}$   
 $\sqrt{25 \cdot 3y} - 2\sqrt{9 \cdot 3y} + \sqrt{16 \cdot 3y}$   
 $5\sqrt{3y} - 6\sqrt{3y} + 4\sqrt{3y}$   
 $3\sqrt{3y}$

Apr 4-9:59 AM

Find the perimeter of a rectangle whose length is  $2\sqrt{b}$  inches and whose width is  $3\sqrt{b}$  inches. Give your answer as a radical expression in simplest form.

$3\sqrt{b} + 2\sqrt{b} + 3\sqrt{b} + 2\sqrt{b}$   
 $10\sqrt{b}$  in

?

Apr 4-10:07 AM

Assignment: 11-7 Worksheet

3.  $\sqrt{\frac{9x^2}{36x^4}} = \frac{\sqrt{9x^2}}{\sqrt{36x^4}} = \frac{3x}{6x^2} = \frac{1}{2x}$

Mar 2-7:44 AM