Adding and Subtracting Radicals

Classwork

Exercises 1–5

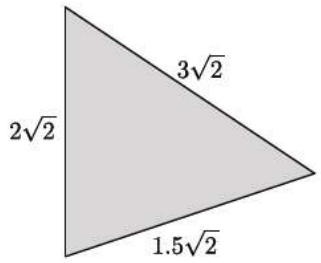
Simplify each expression as much as possible.

1. $\sqrt{32} =$

2. $\sqrt{45} =$

3. $\sqrt{300} =$

4. The triangle shown below has a perimeter of $6.5\sqrt{2}$ units. Make a conjecture about how this answer was reached.



5. The sides of a triangle are $4\sqrt{3}$, $\sqrt{12}$, and $\sqrt{75}$. Make a conjecture about how to determine the perimeter of this triangle.

Exercise 6

6. Circle the expressions that can be simplified using the distributive property. Be prepared to explain your choices.

$8.3\sqrt{2} + 7.9\sqrt{2}$
$\sqrt{13} - \sqrt{6}$
$-15\sqrt{5} + \sqrt{45}$
$11\sqrt{7} - 6\sqrt{7} + 3\sqrt{2}$
$19\sqrt{2} + 2\sqrt{8}$
$4 + \sqrt{11}$
$\sqrt{7} + 2\sqrt{10}$
$\sqrt{12} - \sqrt{75}$
$\sqrt{32} + \sqrt{2}$
$6\sqrt{13} + \sqrt{26}$

Example 1

Explain how the expression $8.3\sqrt{2} + 7.9\sqrt{2}$ can be simplified using the distributive property.

Explain how the expression $11\sqrt{7} - 6\sqrt{7} + 3\sqrt{2}$ can be simplified using the distributive property.

Example 2

Explain how the expression $19\sqrt{2} + 2\sqrt{8}$ can be simplified using the distributive property.

Example 3

Can the expression $\sqrt{7} + 2\sqrt{10}$ be simplified using the distributive property?

To determine if an expression can be simplified, you must first simplify each of the terms within the expression. Then, apply the distributive property, or other properties as needed, to simplify the expression.

Problem Set

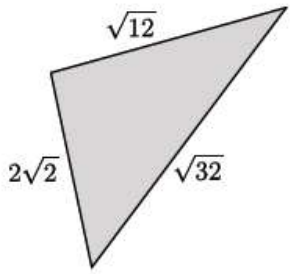
Express each answer in simplified radical form.

1. $18\sqrt{5} - 12\sqrt{5} =$

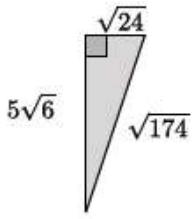
2. $\sqrt{24} + 4\sqrt{54} =$

3. $2\sqrt{7} + 4\sqrt{63} =$

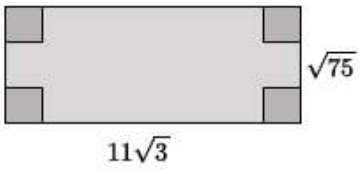
4. What is the perimeter of the triangle shown below?



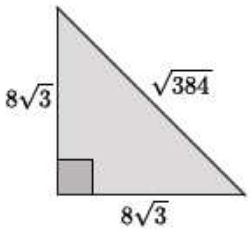
5. Determine the perimeter of the triangle shown. Simplify as much as possible.



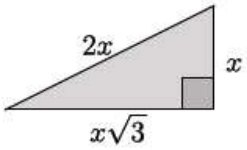
6. Determine the perimeter of the rectangle shown. Simplify as much as possible.



7. Determine the perimeter of the triangle shown. Simplify as much as possible.



8. Determine the perimeter of the triangle shown. Simplify as much as possible.



9. Determine the perimeter of the shaded triangle. Write your answers in simplest radical form, and then approximate to the nearest tenth.