

11.2: Adding and Subtracting Square Roots

A radical expression is in simplest form when:

1. There are no perfect square factors under the radical
2. All like radicals have been combined- like radicals have the same radicand!
3. There are no fractions under the radical
4. There are not radicals in the denominator

Each of the following expressions contains fully-simplified radicals. Circle like radicals and combine them to simplify the expression:

<p>1. $2\sqrt{3} + 7\sqrt{2} - 5\sqrt{2}$</p> $2\sqrt{3} + 2\sqrt{2}$	<p>2. $-3\sqrt{7} - \sqrt{7} - 7\sqrt{6}$</p> $-2\sqrt{7} - 7\sqrt{6}$	<p>3. $\frac{3 \cdot 1}{3 \cdot 2} \sqrt{10} + \frac{2 \cdot 2}{2 \cdot 3} \sqrt{10} - \frac{6 \cdot 4}{6 \cdot 1} \sqrt{10}$</p> $\frac{3}{6} \sqrt{10} + \frac{4}{6} \sqrt{10} - \frac{24}{6} \sqrt{10}$ $-\frac{17}{6} \sqrt{10}$
--	---	---

When asked to add or subtract radicals, simplify each first to see if any are like radicals that you can combine!

Simplify each expression fully:

<p>4. $5\sqrt{3} + \sqrt{48}$</p> $5\sqrt{3} + \sqrt{16 \cdot 3}$ $5\sqrt{3} + 4\sqrt{3}$ $9\sqrt{3}$	<p>5. $\sqrt{63} - 2\sqrt{28}$</p> $\sqrt{9 \cdot 7} - 2\sqrt{4 \cdot 7}$ $3\sqrt{7} - 2 \cdot 2\sqrt{7}$ $3\sqrt{7} - 4\sqrt{7}$ $-1\sqrt{7}$	<p>6. $7\sqrt{24} + \sqrt{21} - 2\sqrt{54}$</p> $7\sqrt{4 \cdot 6} + \sqrt{21} - 2\sqrt{9 \cdot 6}$ $7 \cdot 2\sqrt{6} + \sqrt{21} - 2 \cdot 3\sqrt{6}$ $14\sqrt{6} + \sqrt{21} - 6\sqrt{6}$ $8\sqrt{6} + \sqrt{21}$
<p>7. $\sqrt{45} - \sqrt{845}$</p> $\sqrt{9 \cdot 5} - \sqrt{169 \cdot 5}$ $3\sqrt{5} - 13\sqrt{5}$ $-10\sqrt{5}$	<p>8. $\sqrt{12x^3} - 3x\sqrt{75x}$</p> $\sqrt{4 \cdot 3 \cdot x^2 \cdot x} - 3x\sqrt{25 \cdot 3 \cdot x}$ $2x\sqrt{3x} - 3x \cdot 5\sqrt{3x}$ $2x\sqrt{3x} - 15x\sqrt{3x}$ $-13x\sqrt{3x}$	<p>9. $\sqrt{200p^2} + 5\sqrt{72p^4}$</p> $\sqrt{100 \cdot 2 \cdot p^2} + 5\sqrt{36 \cdot 2 \cdot p^2 \cdot p^2}$ $10p\sqrt{2} + 5 \cdot 6 \cdot p \cdot p\sqrt{2}$ $10p\sqrt{2} + 30p^2\sqrt{2}$