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Simplifying Radicals

A 'radical' is not considered simplified if 1) there are perfect square factors under the radical sign, or 2) if there are radicals in a denominator.

To simplify the first type, write the "prime factorization" of the number under the radical sign, then circle each pair of numbers and write one of those numbers outside the sign. The number outside the radical is the product of these numbers. The number inside is the product of the remaining numbers.

Ex.: $\sqrt{1400} = \sqrt{2 \cdot 2 \cdot 2 \cdot 5 \cdot 5 \cdot 7} = 2 \cdot 5\sqrt{2 \cdot 7} = 10\sqrt{14}$

Simplify

1. $\sqrt{60}$
2. $\sqrt{90}$
3. $\sqrt{189}$
4. $\sqrt{270}$
5. $\sqrt{72}$
6. $\sqrt{175}$
7. $\sqrt{550}$
8. $\sqrt{315}$
9. $\sqrt{245}$
10. $\sqrt{88}$
11. $\sqrt{32}$
12. $\sqrt{64}$
13. $\sqrt{490}$
14. $\sqrt{1300}$
15. $\sqrt{135}$

To remove radicals from the denominator, multiply the numerator and denominator by the radical that appears in the denominator.

Ex. To simplify $\frac{5}{\sqrt{3}}$, multiply by $\frac{\sqrt{3}}{\sqrt{3}}$. $\frac{5}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{3}}{3}$.

Simplify:

1. $\frac{4}{\sqrt{5}}$
2. $\frac{\sqrt{3}}{\sqrt{7}}$
3. $\frac{3}{\sqrt{3}}$
4. $\frac{2\sqrt{5}}{\sqrt{3}}$
5. $\frac{3\sqrt{2}}{2\sqrt{3}}$
6. $\frac{1}{\sqrt{2}}$
7. $\frac{10}{\sqrt{5}}$
8. $\frac{\sqrt{18}}{\sqrt{3}}$
9. $\frac{5}{\sqrt{9}}$