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- I. Practice
- II. Challenge Problems
- III. Answer Key

### Web Resources

 **Radicals and Square Roots:**  
[www.mathwarehouse.com/algebra/radicals/](http://www.mathwarehouse.com/algebra/radicals/)



**Square Root Reducer** - *Express square roots in simplest radical form*  
[www.mathwarehouse.com/arithmetic/square-root-calculator.php](http://www.mathwarehouse.com/arithmetic/square-root-calculator.php)

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## Review of Radicals

### I. Practice Problems

**Simplify.**

1.  $\sqrt{108}$
2.  $-\sqrt{112}$
3.  $\sqrt{140,000}$
4.  $\pm\sqrt{4800}$
5.  $-\sqrt{5040}$
6.  $\sqrt{9464}$
7.  $\pm\sqrt{107811}$
8.  $\sqrt{15300}$

**Simplify.**

9.  $6\sqrt{3} + 4\sqrt{3}$
10.  $5\sqrt{7} + 3\sqrt{17} + 6\sqrt{17} - 8\sqrt{7} + 2\sqrt{7}$
11.  $4\sqrt{20} + \sqrt{8} + \sqrt{5}$
12.  $\sqrt{54} - 4\sqrt{75} + 3\sqrt{27} - \sqrt{63} + 3\sqrt{600}$
13.  $5\sqrt{27} + 6\sqrt{8} - 2\sqrt{75} - 3\sqrt{50} + 4\sqrt{72}$
14.  $4\sqrt{18} - 5\sqrt{45} - 10\sqrt{80} + \sqrt{72} + 4\sqrt{288}$
15.  $10\sqrt{99} - 4\sqrt{28} - \sqrt{44} + 5\sqrt{175} - \sqrt{99}$
16.  $-3\sqrt{54} + 2\sqrt{25} + 3\sqrt{486} - 2\sqrt{30}$
17.  $3\sqrt{1500} + 6\sqrt{135} - 4\sqrt{28} - \sqrt{700}$
18.  $\sqrt{27} - \sqrt{200} + 3\sqrt{50} + 4\sqrt{75}$
19.  $3\sqrt{14}(4\sqrt{21})$
20.  $-3\sqrt{3}(-5\sqrt{6})$
21.  $4\sqrt{21}(-3\sqrt{15})(-4\sqrt{30})$
22.  $\sqrt{3}(\sqrt{15} + \sqrt{21})$
23.  $-2\sqrt{15}(4\sqrt{10} - 6\sqrt{21})$
24.  $\sqrt{21}(\sqrt{35} + \sqrt{77})$
25.  $3\sqrt{6}(2\sqrt{15} - 5\sqrt{10} - 4\sqrt{12})$

$$26. -3\sqrt{30}(2\sqrt{3} + 6\sqrt{50} - \sqrt{87})$$

$$27. -\frac{\sqrt{6}}{\sqrt{30}}$$

$$28. \frac{\sqrt{27}}{\sqrt{297}}$$

$$29. -\frac{\sqrt{13}}{\sqrt{468}}$$

$$30. \frac{\sqrt{15}}{\sqrt{240}}$$

$$31. \pm \frac{\sqrt{12}}{20}$$

$$32. \frac{\sqrt{75}}{\sqrt{125}}$$

$$33. \pm \frac{\sqrt{112}}{\sqrt{20}}$$

$$34. \frac{\sqrt{90}}{\sqrt{14}}$$

$$35. -\frac{\sqrt{84}}{\sqrt{14}}$$

### III. Challenge Problems

**Reverse the process. Un-simplify the simplified radical form. Write as one number under the radicand.**

$$1. 7\sqrt{3}$$

$$2. -12\sqrt{11}$$

3. Given that  $a$  and  $b$  are positive write  $\sqrt{a^5b^4}$  in simplified radical form.

4. Find and explain the mistake in the following:

$$\frac{4\sqrt{7} + 2\sqrt{7}}{6\sqrt{14}}$$

5. A student claims that  $4\sqrt{867} + 5\sqrt{578}$  is simplified because the radicands are not equal. Is the student correct? Why?

6. Simplify:  $(\sqrt{30} + 4\sqrt{60})(\sqrt{70} - 2\sqrt{21})$

7. Find  $a$  if  $\sqrt{a}(\sqrt{14}) = 2\sqrt{7}$ .

### Answer Key

- $6\sqrt{3}$
- $-4\sqrt{7}$
- $100\sqrt{14}$
- $\pm 40\sqrt{3}$
- $-12\sqrt{35}$
- $26\sqrt{14}$
- $\pm 99\sqrt{11}$
- $30\sqrt{17}$
- $10\sqrt{3}$
- $-\sqrt{7} + 9\sqrt{17}$
- $9\sqrt{5} + 2\sqrt{2}$
- $33\sqrt{6} - 11\sqrt{3} - 3\sqrt{7}$
- $-5\sqrt{3} + 21\sqrt{3}$
- $66\sqrt{2} - 55\sqrt{5}$
- $25\sqrt{11} + 17\sqrt{7}$
- $10 + 18\sqrt{6} - 2\sqrt{30}$
- $48\sqrt{15} - 18\sqrt{7}$
- $23\sqrt{3} + 65\sqrt{2}$
- $84\sqrt{6}$
- $45\sqrt{2}$
- $720\sqrt{42}$
- $3\sqrt{5} + 3\sqrt{7}$
- $-40\sqrt{6} + 36\sqrt{35}$
- $7\sqrt{15} + 7\sqrt{33}$
- $18\sqrt{10} - 30\sqrt{30} - 72\sqrt{2}$
- $-18\sqrt{10} - 180\sqrt{15} - 9\sqrt{290}$
- $-\frac{\sqrt{5}}{5}$

- $\frac{\sqrt{11}}{11}$
- $-\frac{1}{6}$
- $\frac{1}{4}$
- $\pm \frac{\sqrt{3}}{10}$
- $\frac{\sqrt{15}}{5}$
- $\pm \frac{2\sqrt{35}}{5}$
- $\frac{3\sqrt{35}}{7}$
- $-\sqrt{6}$

### Challenge Problems

- $\sqrt{147}$
- $-\sqrt{1584}$
- $a^2b^2\sqrt{a}$
- Do not add values of the radicand; correct answer  $6\sqrt{7}$
- No, need to simplify radicals before determining if any terms have identical radicands.
- $10\sqrt{21} - 6\sqrt{70} + 8\sqrt{105} - 24\sqrt{21}$
- $a = 2$