

# 11.1 Simplifying Radicals

Algebra 1

Name: Solutions

**Practice**

Approximate the square root to one decimal. Justify your answer with inequalities.

1. $\sqrt{24}$ $\sqrt{16} < \sqrt{24} < \sqrt{25}$ <b>4.9</b>	2. $\sqrt{52}$ $\sqrt{49} < \sqrt{52} < \sqrt{64}$ <b>7.2</b>	3. $\sqrt{70}$ $\sqrt{64} < \sqrt{70} < \sqrt{81}$ <b>8.4</b>	4. $\sqrt{108}$ $\sqrt{100} < \sqrt{108} < \sqrt{121}$ <b>10.4</b>	5. $\sqrt{38}$ $\sqrt{36} < \sqrt{38} < \sqrt{49}$ <b>6.1</b>
6. $\sqrt{95}$ $\sqrt{81} < \sqrt{95} < \sqrt{100}$ <b>9.7</b>	7. $\sqrt{5}$ $\sqrt{4} < \sqrt{5} < \sqrt{9}$ <b>2.2</b>	8. $\sqrt{45}$ $\sqrt{36} < \sqrt{45} < \sqrt{49}$ <b>6.6</b>	9. $\sqrt{130}$ $\sqrt{121} < \sqrt{130} < \sqrt{144}$ <b>11.3</b>	10. $\sqrt{15}$ $\sqrt{9} < \sqrt{15} < \sqrt{16}$ <b>3.8</b>

Simplify the following radicals. You can use any strategy EXCEPT a calculator. 😊

11. $\sqrt{125}$ $\sqrt{25 \cdot 5}$ <b><math>5\sqrt{5}</math></b>	12. $\sqrt{54}$ $\sqrt{9 \cdot 6}$ <b><math>3\sqrt{6}</math></b>	13. $\sqrt{175}$ $\sqrt{25 \cdot 7}$ <b><math>5\sqrt{7}</math></b>	14. $2\sqrt{147}$ $2\sqrt{49 \cdot 3}$ $2 \cdot 7 \sqrt{3}$ <b><math>14\sqrt{3}</math></b>
15. $3\sqrt{24}$ $3\sqrt{4 \cdot 6}$ $3 \cdot 2 \sqrt{6}$ <b><math>6\sqrt{6}</math></b>	16. $\sqrt{392}$ $\sqrt{4 \cdot 98}$ $\sqrt{4 \cdot 2 \cdot 49}$ $2 \cdot \sqrt{2} \cdot 7$ <b><math>14\sqrt{2}</math></b>	17. $\sqrt{300}$ $\sqrt{100 \cdot 3}$ <b><math>10\sqrt{3}</math></b>	18. $\sqrt{162}$ $\sqrt{2 \cdot 81}$ <b><math>9\sqrt{2}</math></b>
19. $\sqrt{10 \cdot 15}$ $\sqrt{2 \cdot 5 \cdot 5 \cdot 3}$ <b><math>5\sqrt{6}</math></b>	20. $\sqrt{20 \cdot 30}$ $\sqrt{2 \cdot 10 \cdot 10 \cdot 3}$ <b><math>10\sqrt{6}</math></b>	21. $3\sqrt{35 \cdot 7}$ $3\sqrt{5 \cdot 7 \cdot 7}$ $3 \cdot 7 \sqrt{5}$ <b><math>21\sqrt{5}</math></b>	

22.  $2\sqrt{18} \cdot 4\sqrt{27}$

$$8\sqrt{9 \cdot 2 \cdot 3 \cdot 9}$$

$$8 \cdot 9 \sqrt{6}$$

$$72\sqrt{6}$$

23.  $\sqrt{60} \cdot 2\sqrt{30}$

$$2\sqrt{2 \cdot 30 \cdot 30}$$

$$2 \cdot 30 \sqrt{2}$$

$$60\sqrt{2}$$

24.  $5\sqrt{12} \cdot 2\sqrt{24}$

$$10\sqrt{12 \cdot 12 \cdot 2}$$

$$10 \cdot 12 \sqrt{2}$$

$$120\sqrt{2}$$

25.  $3\sqrt{18} - \sqrt{32}$

$$3\sqrt{9 \cdot 2} - \sqrt{16 \cdot 2}$$

$$3 \cdot 3\sqrt{2} - 4\sqrt{2}$$

$$9\sqrt{2} - 4\sqrt{2}$$

$$5\sqrt{2}$$

26.  $3\sqrt{3} - 3\sqrt{12}$

$$3\sqrt{3} - 3\sqrt{4 \cdot 3}$$

$$3\sqrt{3} - 3 \cdot 2\sqrt{3}$$

$$3\sqrt{3} - 6\sqrt{3}$$

$$-3\sqrt{3}$$

27.  $-2\sqrt{2} + 3\sqrt{8}$

$$-2\sqrt{2} + 3\sqrt{4 \cdot 2}$$

$$-2\sqrt{2} + 3 \cdot 2\sqrt{2}$$

$$-2\sqrt{2} + 6\sqrt{2}$$

$$4\sqrt{2}$$

28.  $2\sqrt{45} - 2\sqrt{20}$

$$2\sqrt{9 \cdot 5} - 2\sqrt{4 \cdot 5}$$

$$2 \cdot 3\sqrt{5} - 2 \cdot 2\sqrt{5}$$

$$6\sqrt{5} - 4\sqrt{5}$$

$$2\sqrt{5}$$

29.  $3\sqrt{2} + 2\sqrt{8}$

$$3\sqrt{2} + 2\sqrt{4 \cdot 2}$$

$$3\sqrt{2} + 2 \cdot 2\sqrt{2}$$

$$3\sqrt{2} + 4\sqrt{2}$$

$$7\sqrt{2}$$

30.  $2\sqrt{24} - 2\sqrt{54}$

$$2\sqrt{4 \cdot 6} - 2\sqrt{9 \cdot 6}$$

$$2 \cdot 2\sqrt{6} - 2 \cdot 3\sqrt{6}$$

$$4\sqrt{6} - 6\sqrt{6}$$

$$-2\sqrt{6}$$