

Simplifying Radicals Worksheet

Simplify each expression. Leave your answer in simplest radical form (no perfect square factors inside the radical).

1. Simplify the square roots.

- a) $\sqrt{36} =$ _____ f) $\sqrt{196} =$ _____
 b) $\sqrt{64} =$ _____ g) $\sqrt{225} =$ _____
 c) $\sqrt{81} =$ _____ h) $\sqrt{289} =$ _____
 d) $\sqrt{100} =$ _____ i) $\sqrt{400} =$ _____
 e) $\sqrt{144} =$ _____ j) $\sqrt{625} =$ _____

2. Simplify the square roots of variables.

- a) $\sqrt{x^2} =$ _____ f) $\sqrt{49b^2} =$ _____
 b) $\sqrt{y^2} =$ _____ g) $\sqrt{64c^6} =$ _____
 c) $\sqrt{16x^2} =$ _____ h) $\sqrt{121m^8} =$ _____
 d) $\sqrt{25y^2} =$ _____ i) $\sqrt{0.36a^2} =$ _____
 e) $\sqrt{9a^4} =$ _____ j) $\sqrt{0.81x^4} =$ _____

3. Simplify the square roots of products.

- a) $\sqrt{12} =$ _____ f) $\sqrt{45} =$ _____
 b) $\sqrt{18} =$ _____ g) $\sqrt{50} =$ _____
 c) $\sqrt{20} =$ _____ h) $\sqrt{72} =$ _____
 d) $\sqrt{27} =$ _____ i) $\sqrt{98} =$ _____
 e) $\sqrt{32} =$ _____ j) $\sqrt{128} =$ _____

4. Simplify the square roots of quotients.

- a) $\sqrt{\frac{8}{2}} =$ _____ f) $\sqrt{\frac{98}{2}} =$ _____
 b) $\sqrt{\frac{18}{2}} =$ _____ g) $\sqrt{\frac{128}{8}} =$ _____
 c) $\sqrt{\frac{32}{8}} =$ _____ h) $\sqrt{\frac{200}{4}} =$ _____
 d) $\sqrt{\frac{50}{2}} =$ _____ i) $\sqrt{\frac{242}{2}} =$ _____
 e) $\sqrt{\frac{72}{8}} =$ _____ j) $\sqrt{\frac{288}{12}} =$ _____

5. Simplify the expression.

- a) $2\sqrt{3} =$ _____ f) $7\sqrt{13} =$ _____
 b) $3\sqrt{5} =$ _____ g) $8\sqrt{17} =$ _____
 c) $4\sqrt{7} =$ _____ h) $9\sqrt{19} =$ _____
 d) $5\sqrt{2} =$ _____ i) $10\sqrt{23} =$ _____
 e) $6\sqrt{11} =$ _____ j) $12\sqrt{29} =$ _____

6. Simplify the expression.

- a) $3\sqrt{12} =$ _____ f) $8\sqrt{45} =$ _____
 b) $5\sqrt{18} =$ _____ g) $9\sqrt{50} =$ _____
 c) $7\sqrt{20} =$ _____ h) $11\sqrt{72} =$ _____
 d) $4\sqrt{27} =$ _____ i) $13\sqrt{98} =$ _____
 e) $6\sqrt{32} =$ _____ j) $15\sqrt{128} =$ _____

7. Rationalize the denominator.

- a) $\frac{1}{\sqrt{2}} =$ _____ f) $\frac{4}{\sqrt{6}} =$ _____
 b) $\frac{3}{\sqrt{3}} =$ _____ g) $\frac{6}{\sqrt{8}} =$ _____
 c) $\frac{5}{\sqrt{5}} =$ _____ h) $\frac{8}{\sqrt{10}} =$ _____
 d) $\frac{7}{\sqrt{7}} =$ _____ i) $\frac{12}{\sqrt{12}} =$ _____
 e) $\frac{9}{\sqrt{9}} =$ _____ j) $\frac{15}{\sqrt{18}} =$ _____

8. Simplify the expression.

- a) $\sqrt{75} =$ _____ f) $\sqrt{364} =$ _____
 b) $\sqrt{108} =$ _____ g) $\sqrt{432} =$ _____
 c) $\sqrt{147} =$ _____ h) $\sqrt{500} =$ _____
 d) $\sqrt{243} =$ _____ i) $\sqrt{675} =$ _____
 e) $\sqrt{300} =$ _____ j) $\sqrt{768} =$ _____

9. Solve the following.

- a) What is $\sqrt{80} + \sqrt{45}$? _____
 b) What is $\sqrt{72} - \sqrt{18}$? _____
 c) What is $(\sqrt{5})^2$? _____
 d) What is $\sqrt{2} \times \sqrt{8}$? _____
 e) What is $\sqrt{50} \div \sqrt{2}$? _____

10. Challenge.

- a) Simplify $\sqrt{200} - \sqrt{50} + \sqrt{8}$. _____
 b) Simplify $(\sqrt{3} + \sqrt{5})(\sqrt{3} - \sqrt{5})$. _____
 c) If $\sqrt{x^2} = 7$, what are the possible values of x? _____
 d) Simplify $\sqrt{3} + \sqrt{48} - \sqrt{27}$. _____