

Simplify. Assume all variables represent positive numbers.

- | | Answers: |
|---|---|
| 1. $\sqrt{81}$ | 1. 9 |
| 2. $\sqrt[3]{-64}$ | 2. -4 |
| 3. $\sqrt{16x^2y^6}$ | 3. $4xy^3$ |
| 4. $\sqrt{\frac{64}{25}}$ | 4. $\frac{8}{5}$ |
| 5. $\sqrt{-27}$ | 5. not real |
| 6. $\sqrt{48}$ | 6. $4\sqrt{3}$ |
| 7. $\sqrt{32x^5}$ | 7. $4x^2\sqrt{2x}$ |
| 8. $\sqrt[3]{108}$ | 8. $3\sqrt[3]{4}$ |
| 9. $\frac{\sqrt{8}}{3\sqrt{2}}$ | 9. $\frac{2}{3}$ |
| 10. $\sqrt{\frac{x^5y^3}{121z^4}}$ | 10. $\frac{x^2y}{11z^2}\sqrt{xy}$ |
| 11. $3\sqrt{5} + 8\sqrt{5}$ | 11. $11\sqrt{5}$ |
| 12. $\sqrt{8x^3} + 4\sqrt{18x^5} - x\sqrt{98x}$ | 12. $12x^2\sqrt{2x} - 5x\sqrt{2x}$ |
| 13. $10(\sqrt{10} - 4)$ | 13. $10\sqrt{10} - 40$ |
| 14. $(\sqrt{7} - 2)(\sqrt{7} + 2)$ | 14. 3 |
| 15. $(\sqrt{6} - \sqrt{3})(\sqrt{3} - 5)$ | 15. $3\sqrt{2} - 5\sqrt{6} - 3 + 5\sqrt{3}$ |
| 16. $(\sqrt{11} - \sqrt{12})^2$ | 16. $23 - 4\sqrt{33}$ |

Use the Pythagorean Theorem to find the sides of a right triangle, and write the answer in simplified radical form:

- | | |
|---|-----------------|
| 17. When $a = 5$ and $b = 7$, find c | 17. $\sqrt{74}$ |
| 18. When $b = 40$ and $c = 41$, find a | 18. 9 |

Rationalize each denominator:

19. $\frac{15}{\sqrt{5}}$

20. $\frac{4}{\sqrt{x}}$

21. $\frac{\sqrt{22}}{2\sqrt{6}}$

22. $\frac{5}{2-\sqrt{7}}$

19. $3\sqrt{5}$

20. $\frac{4\sqrt{x}}{x}$

21. $\frac{\sqrt{33}}{6}$

22. $-\frac{5(2+\sqrt{7})}{3}$

Solve each equation:

23. $\sqrt{3y} = 12$

24. $\sqrt{a-1} = 7-a$

25. $\sqrt{5x+49} - 2x = 2$

23. 48

24. 5, (10 is extraneous)

25. 3, $\left(-\frac{15}{4} \text{ is extraneous}\right)$