



MM1A2a Simplify algebraic and numeric expressions involving square root.

MM1A2b Perform operations with square roots.

Simplify the expression.

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|-------------------------------|--------------------------------|---------------------------------|
| 1. $\sqrt{200}$ | 2. $\sqrt{45}$ | 3. $\sqrt{112}$ |
| 4. $\sqrt{400d}$ | 5. $\sqrt{9y^2}$ | 6. $\sqrt{25n^3}$ |
| 7. $\sqrt{3} \cdot \sqrt{21}$ | 8. $\sqrt{20} \cdot \sqrt{15}$ | 9. $\sqrt{10x} \cdot \sqrt{2x}$ |
| 10. $\sqrt{\frac{16}{81}}$ | 11. $\sqrt{\frac{5}{49}}$ | 12. $\sqrt{\frac{x^2}{144}}$ |

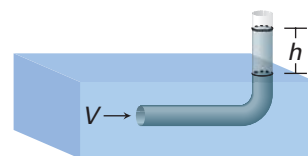
Simplify the expression by rationalizing the denominator.

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| 13. $\frac{4}{\sqrt{5}}$ | 14. $\frac{2}{\sqrt{p}}$ | 15. $\frac{9}{\sqrt{2x}}$ |
| 16. $\frac{1}{5 + \sqrt{3}}$ | 17. $\frac{6}{4 + \sqrt{5}}$ | 18. $\frac{9}{7 - \sqrt{2}}$ |

Simplify the expression.

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|--------------------------------|-----------------------------|------------------------------------|
| 19. $10\sqrt{7} + 3\sqrt{7}$ | 20. $4\sqrt{5} - 7\sqrt{5}$ | 21. $\sqrt{7}(4 - \sqrt{7})$ |
| 22. $\sqrt{5}(8\sqrt{10} + 1)$ | 23. $(2\sqrt{3} + 5)^2$ | 24. $(6 + \sqrt{3})(6 - \sqrt{3})$ |

25. Water Flow You can measure the speed of water by using an L-shaped tube. The speed V of the water (in miles per hour) is given by the function $V = \sqrt{\frac{5}{2}h}$ where h is the height of the column of water above the surface (in inches).



- If you use the tube in a river and find that h is 6 inches, what is the speed of the water? Round your answer to the nearest hundredth.
 - If you use the tube in a river and find that h is 8.5 inches, what is the speed of the water? Round your answer to the nearest hundredth.
- 26. Walking Speed** The maximum walking speed S (in feet per second) of an animal is given by the function $S = \sqrt{gL}$ where g is 32 feet per second squared and L is the length of the animal's leg (in feet).
- How fast can an animal whose legs are 9 inches long walk? Round your answer to the nearest hundredth.
 - How fast can an animal whose legs are 3 feet long walk? Round your answer to the nearest hundredth.



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|------------------------------------|-------------------------------|----------------------------------|
| 1. $\sqrt{45s^3}$ | 2. $\sqrt{196r^4}$ | 3. $\sqrt{450c^5}$ |
| 4. $\sqrt{124m^4n^{10}}$ | 5. $11\sqrt{x^7y^8}$ | 6. $\sqrt{a^3b} \cdot \sqrt{ab}$ |
| 7. $\sqrt{27xy} \cdot \sqrt{5y^3}$ | 8. $\sqrt{\frac{121}{16m^2}}$ | 9. $\sqrt{\frac{5d^2}{125}}$ |

Simplify the expression by rationalizing the denominator.

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|------------------------------|------------------------------|-------------------------------------|
| 10. $\sqrt{\frac{5}{8}}$ | 11. $\sqrt{\frac{7m^5}{11}}$ | 12. $\sqrt{\frac{125}{4x^3}}$ |
| 13. $\frac{2}{5 - \sqrt{3}}$ | 14. $\frac{1}{\sqrt{7} + 1}$ | 15. $\frac{\sqrt{5}}{6 + \sqrt{5}}$ |

Simplify the expression.

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| 16. $\sqrt{15} + 5\sqrt{3} - 2\sqrt{27}$ | 17. $\sqrt{7}(3 - 2\sqrt{7})$ | 18. $\sqrt{2}(3\sqrt{14} - \sqrt{7})$ |
| 19. $(3\sqrt{12} + 5)^2$ | 20. $(8\sqrt{3} + \sqrt{2})(1 - \sqrt{3})$ | 21. $\sqrt{\frac{250m^3}{2n}}$ |
| 22. $\frac{5}{\sqrt{7}} + \frac{2}{\sqrt{14}}$ | 23. $\frac{4\sqrt{10}}{\sqrt{30}} - \frac{2}{\sqrt{3}}$ | 24. $\frac{4}{\sqrt{x}} + \frac{5}{2\sqrt{x}}$ |

25. **Electricity** Current, power, and resistance are related by the formula $I = \sqrt{\frac{P}{R}}$ where I is the current (in amps), P is the power (in watts), and R is the resistance (in ohms).
- A light bulb with a 283-ohm resistor is using 0.42 amp of current. What is the wattage of the light bulb? Round your answer to the nearest whole watt.
 - A light bulb with a 145-ohm resistor is using 0.83 amp of current. What is the wattage of the light bulb? Round your answer to the nearest whole watt.
26. **Medicine** A doctor may need to know a person's body surface area to prescribe the correct amount of medicine. A person's body surface area A (in square meters) is given by the function $A = \sqrt{\frac{hw}{3131}}$ where h is the height (in inches) and w is the weight (in pounds).
- Find the body surface area of a person who is 5 feet 5 inches tall and weighs 110 pounds. Round your answer to the nearest tenth of a meter.
 - Find the body surface area of a person who is 5 feet 10 inches tall and weighs 150 pounds. Round your answer to the nearest tenth of a meter.