

Simplifying Radical Expressions Using Properties of Radicals

In problems 1-2, use the product property to multiply. Assume that all variables can be any real number

1. $\sqrt[4]{2} \cdot \sqrt[4]{12}$	2. $\sqrt[3]{x} \cdot \sqrt[3]{7x}$
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In problems 3-9, simplify each radical using the Product Property. Assume that all variables can be any real number

3. $\sqrt[3]{32}$	4. $\sqrt[3]{-108}$
5. $\sqrt{24p^4q^3}$	6. $\sqrt{x^{21}}$
7. $\sqrt{18x^{30}y^{25}}$	8. $\sqrt[5]{-32x^{31}y^{52}}$
9. $\sqrt{16x^2 - 16}$	

In problem 10, simplify each expression

10. $\frac{8 + \sqrt{12}}{10}$	
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In problems 11-15, multiply and simplify. Assume that all variables are greater than or equal to zero

11. $\sqrt{7} \cdot \sqrt{7}$	12. $\sqrt[5]{2} \cdot \sqrt[5]{16}$
13. $\sqrt[3]{12ab} \cdot \sqrt[3]{6a^7b^9}$	14. $\sqrt[5]{16x^{20}y^2} \cdot \sqrt[5]{20x^{17}y^5}$
15. $\sqrt{2(3x+1)^2} \cdot \sqrt{8(3x+1)^4}$	

In problems 16-17, Simplify each expression. Assume that all variables are greater than zero.

16. $\sqrt[3]{\frac{3x^7}{8}}$	17. $\sqrt[5]{\frac{-x^{10}}{32y^{20}}}$
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In problems 18-20, divide and simplify. Assume that all variables are greater than zero

18. $\frac{\sqrt[3]{54}}{\sqrt[3]{2}}$	19. $\frac{\sqrt{32a^6b}}{\sqrt{2a^3b^{11}}}$
20. $\frac{\sqrt[3]{40x^{-4}y^{20}}}{\sqrt[3]{5x^2y^{-7}}}$	

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In problems 21-22, multiply and simplify

21. $\sqrt{2} \cdot \sqrt[3]{5}$	22. $\sqrt[3]{2} \cdot \sqrt[5]{2}$
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