

Mixed & Entire Radicals

Mixed Square Radicals → Entire Radicals

Rewrite each expression as an entire radical.

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|----|-------------|----|-------------|-----|-------------|-----|--------------|
| 1. | $2\sqrt{3}$ | 5. | $3\sqrt{5}$ | 9. | $6\sqrt{5}$ | 13. | $12\sqrt{3}$ |
| 2. | $2\sqrt{5}$ | 6. | $4\sqrt{3}$ | 10. | $7\sqrt{3}$ | 14. | $15\sqrt{7}$ |
| 3. | $3\sqrt{2}$ | 7. | $4\sqrt{5}$ | 11. | $8\sqrt{5}$ | | |
| 4. | $4\sqrt{2}$ | 8. | $5\sqrt{2}$ | 12. | $9\sqrt{6}$ | | |

Mixed Cube Radicals → Entire Radicals

Rewrite each expression as an entire radical.

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|----|----------------|----|-----------------|-----|-----------------|-----|----------------|
| 1. | $2\sqrt[3]{2}$ | 5. | $2\sqrt[3]{11}$ | 9. | $4\sqrt[3]{5}$ | 13. | $7\sqrt[3]{3}$ |
| 2. | $2\sqrt[3]{3}$ | 6. | $3\sqrt[3]{5}$ | 10. | $5\sqrt[3]{3}$ | 14. | $8\sqrt[3]{5}$ |
| 3. | $2\sqrt[3]{5}$ | 7. | $4\sqrt[3]{2}$ | 11. | $4\sqrt[3]{14}$ | | |
| 4. | $3\sqrt[3]{2}$ | 8. | $4\sqrt[3]{3}$ | 12. | $6\sqrt[3]{2}$ | | |

Entire Square Radicals → Mixed Radicals

Rewrite each expression as a mixed radical.

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|----|-------------|----|-------------|-----|---------------|-----|---------------|
| 1. | $\sqrt{12}$ | 5. | $\sqrt{45}$ | 9. | $\sqrt{1000}$ | 13. | $\sqrt{1575}$ |
| 2. | $\sqrt{18}$ | 6. | $\sqrt{48}$ | 10. | $\sqrt{320}$ | 14. | $\sqrt{1452}$ |
| 3. | $\sqrt{20}$ | 7. | $\sqrt{75}$ | 11. | $\sqrt{242}$ | | |
| 4. | $\sqrt{27}$ | 8. | $\sqrt{98}$ | 12. | $\sqrt{432}$ | | |

Entire Cube Radicals → Mixed Radicals

Rewrite each expression as a mixed radical.

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|-------------------|--------------------|----------------------|----------------------|
| 1. $\sqrt[3]{16}$ | 5. $\sqrt[3]{54}$ | 9. $\sqrt[3]{375}$ | 13. $\sqrt[3]{1029}$ |
| 2. $\sqrt[3]{24}$ | 6. $\sqrt[3]{81}$ | 10. $\sqrt[3]{648}$ | 14. $\sqrt[3]{1512}$ |
| 3. $\sqrt[3]{40}$ | 7. $\sqrt[3]{128}$ | 11. $\sqrt[3]{1375}$ | |
| 4. $\sqrt[3]{56}$ | 8. $\sqrt[3]{135}$ | 12. $\sqrt[3]{1944}$ | |

Word Problems → Radicals

1. A square garden has an area of 320 m^2 . Find the exact length of one side. Write your answer as a mixed radical.
2. A wooden cube has a volume of 375 cm^3 . Find the exact length of one edge. Write your answer as a mixed radical.
3. A square patio has an area of 432 m^2 . Find the exact perimeter of the patio.
4. A cube-shaped display has a volume of 1375 cm^3 . A metal strip is placed along all 12 edges of the cube. Find the exact total length of metal strip required.
5. A square sign has a side length of $15\sqrt{7} \text{ cm}$. Find the exact area of the sign.
6. A cube-shaped container has an edge length of $7\sqrt[3]{3} \text{ dm}$. Find the exact volume of the container.
7. Two construction drawings give the side length of the same square panel differently. One drawing gives $15\sqrt{7} \text{ mm}$ and the other gives $\sqrt{1575} \text{ mm}$. Are the two measurements equivalent?
8. A cube-shaped frame uses a total of $96\sqrt[3]{5} \text{ cm}$ of material for its 12 equal edges. Find the exact volume enclosed by the cube.
9. A square garden has an area of 1000 m^2 . Border stones are sold in lengths of $10\sqrt{10} \text{ m}$.
 - a) Find the exact length of one side of the garden.
 - b) Find the exact perimeter of the garden.
 - c) How many border stones are needed to go all the way around the garden?
10. A cube has a volume of 1944 cm^3 . Each support rod has a length of $2\sqrt[3]{9} \text{ cm}$.
 - a) Find the exact length of one edge of the cube.
 - b) How many support rods placed end-to-end are needed to make one edge?
 - c) How many support rods are needed to build all 12 edges of the cube?