Assignment

Write

Describe how to extract a perfect root from $\sqrt{45}$.

Remember

If the difference in the input values is the same, an exponential function shows a constant multiplier between output values, no matter how large or how small the gap between input values.

If n is an integer greater than 1, then $\sqrt[n]{a} = a^{\frac{1}{n}}$.

Practice

Rewrite each radical using a rational exponent.

1. $\sqrt[4]{88}$
2. $\sqrt[10]{46}$
3. $\sqrt[6]{x}$
4. $\sqrt{z}$

Rewrite each power in radical form.

5. $9^{\frac{1}{3}}$
6. $5^{\frac{1}{2}}$
7. $20^{\frac{1}{5}}$
8. $41^{\frac{1}{8}}$
9. $8^{\frac{1}{4}}$
10. $100^{\frac{1}{4}}$
11. $32^{\frac{1}{2}}$
12. $70^{\frac{1}{7}}$
13. $n^{\frac{1}{6}}$
14. $m^{\frac{1}{9}}$

Rewrite each power in radical form. Simplify your answer, if possible.

15. $16^{\frac{3}{2}}$
16. $5^{\frac{7}{4}}$
17. $12^{\frac{2}{5}}$
18. $8^{\frac{4}{3}}$
19. $2^{\frac{5}{6}}$
20. $15^{\frac{6}{7}}$

Rewrite each expression using a rational exponent. Simplify your answer, if possible.

21. $(\sqrt[5]{10})^4$
22. $(\sqrt[4]{t})^4$
23. $(\sqrt{w})^6$
24. $(\sqrt[9]{h})^3$

Solve each exponential equation for x.

25. $4^x = 256$
26. $6^{3x} = 36$
27. $2^{5-x} = \frac{1}{16}$
28. $3^{-2x} = \frac{1}{81}$
29. $4^{x+3} = 4$
30. $\frac{1}{5^{x+4}} = 625$

Stretch

How do rational exponents help you to multiply or divide two radicals with different indices ($\sqrt[m]{a} \cdot \sqrt[n]{a}$ or $\frac{\sqrt[m]{a}}{\sqrt[n]{a}}$, when $m \neq n$)? Include two examples to support your answer.

Review

1. Solve each equation. Show your work.

   a. $|x - 4| = 7$

   b. $|3x + 5| = 11$

2. Determine the inverse of each function. Is the inverse also a function? Explain why or why not.

   a. $y = -4$

   b. $y = \left(\frac{1}{4}\right)x + \frac{3}{2}$

3. Solve each system of linear equations.

   a. $\begin{cases} y = -5x - 21 \\ -2x + 5y = -24 \end{cases}$

   b. $\begin{cases} 8x - 3y = 4 \\ 7x - 10y = -26 \end{cases}$