

## Rational Exponents Maze

Directions: Rewrite each expression in simplest radical form. Use your solutions to navigate through the maze.

Maze grid for Version 1. Start:  $x^{\frac{1}{2}}$ . End:  $x^{\frac{1}{2}}$ .

Expressions in the maze include:  $x^{\frac{3}{4}}$ ,  $\sqrt[4]{x^3}$ ,  $(2x)^{\frac{7}{3}}$ ,  $4x^2\sqrt[3]{2x}$ ,  $2(8x)^{\frac{1}{2}}$ ,  $8\sqrt{x}$ ,  $x^{\frac{17}{2}}$ ,  $x^{\frac{3}{4}\sqrt{x}}$ ,  $7\sqrt[3]{x^2}$ ,  $8x^2\sqrt{x}$ ,  $14\sqrt[3]{x^2}$ ,  $4\sqrt{2x}$ ,  $4\sqrt{x}$ ,  $x^4\sqrt{x}$ ,  $x^{\frac{5}{2}}$ ,  $\sqrt[3]{7x^2}$ ,  $7x^{\frac{2}{3}}$ ,  $125x^9\sqrt[3]{x}$ ,  $125x^{\frac{10}{3}}$ ,  $125x^3\sqrt[3]{x}$ ,  $x^{\frac{9}{4}}$ ,  $x^2\sqrt{x}$ ,  $\sqrt[3]{49x^2}$ ,  $3\sqrt[3]{x}$ ,  $\sqrt[3]{49x^2}$ ,  $5x^2\sqrt[3]{x}$ ,  $x^2\sqrt[3]{x}$ ,  $\sqrt[3]{x^4}$ ,  $x^{\frac{1}{2}}$ ,  $\sqrt{x}$ ,  $(27x)^{\frac{1}{3}}$ ,  $\sqrt[3]{9x}$ ,  $(3x)^{\frac{2}{3}}$ ,  $9\sqrt[3]{x^2}$ ,  $8x^{\frac{5}{4}}$ ,  $3\sqrt[3]{x}$ ,  $x^3\sqrt[3]{x}$ ,  $9\sqrt[3]{x}$ ,  $\sqrt[3]{9x^2}$ ,  $9\sqrt{2x}$ ,  $\sqrt{9x}$ ,  $8x^4\sqrt{x}$ ,  $3x^{\frac{1}{3}}$ ,  $\sqrt[3]{3x}$ ,  $(4x)^{\frac{5}{2}}$ ,  $1024x^2\sqrt{x}$ ,  $6^{\frac{3}{2}}x^{\frac{1}{2}}$ ,  $6\sqrt{6x}$ ,  $32^{\frac{1}{2}}x^{\frac{17}{4}}$ ,  $\sqrt{4x^5}$ ,  $64x^2\sqrt{x}$ ,  $32x^2\sqrt{x}$ ,  $32x^4\sqrt{x}$ ,  $x^3y\sqrt[3]{xy}$ ,  $x^3y^3\sqrt[3]{xy}$ ,  $4x^4\sqrt{2x}$ ,  $(2x)^{\frac{2}{5}}$ ,  $-8\sqrt[3]{x^2}$ ,  $(-8x)^{\frac{2}{3}}$ ,  $4\sqrt[3]{x^2}$ ,  $x^{\frac{10}{3}}y^{\frac{4}{3}}$ ,  $x^3y^3\sqrt[3]{xy}$ ,  $x^3y^3\sqrt[3]{xy}$ ,  $4x^4\sqrt{2x}$ .

Version 1: Converting Exponential Form to Radical Form

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## Rational Exponents Maze

Directions: Rewrite each expression in exponential form. Use your solutions to navigate through the maze.

Maze grid for Version 2. Start:  $\sqrt{3x}$ . End:  $\sqrt{3x}$ .

Expressions in the maze include:  $(36x)^{\frac{2}{3}}$ ,  $\sqrt[3]{6x^2}$ ,  $(6x^2)^{\frac{1}{3}}$ ,  $\sqrt[5]{x^3}$ ,  $x^6$ ,  $\sqrt[6]{x}$ ,  $2x^{\frac{3}{2}}$ ,  $(2x)^{\frac{4}{3}}$ ,  $(2x)^{\frac{3}{4}}$ ,  $8x^{\frac{3}{4}}$ ,  $x^{\frac{5}{3}}$ ,  $x^{\frac{3}{5}}$ ,  $x^{\frac{1}{6}}$ ,  $\sqrt{4x^3}$ ,  $(4x)^{\frac{3}{2}}$ ,  $\sqrt[3]{2x^3}$ ,  $(3x)^{\frac{1}{2}}$ ,  $\sqrt{3x}$ ,  $5x^{\frac{2}{5}}$ ,  $\sqrt[5]{(5x)^2}$ ,  $6x^{\frac{2}{3}}$ ,  $36x^{\frac{2}{3}}$ ,  $(7x)^{\frac{1}{5}}$ ,  $2x^{\frac{3}{4}}$ ,  $3x^{\frac{1}{2}}$ ,  $(25x)^{\frac{2}{5}}$ ,  $(5x)^{\frac{2}{5}}$ ,  $\sqrt[3]{216x^2}$ ,  $7x^{\frac{1}{5}}$ ,  $\sqrt[3]{7x}$ ,  $9x^{\frac{1}{3}}$ ,  $\sqrt[3]{9x}$ ,  $x^{\frac{4}{3}}$ ,  $\sqrt[3]{x^4}$ ,  $(12x^3y)^{\frac{1}{4}}$ ,  $216x^{\frac{5}{3}}$ ,  $35x^{\frac{1}{5}}$ ,  $(25x^2y^4)^{\frac{1}{4}}$ ,  $9xy^{\frac{1}{2}}$ ,  $(9x)^{\frac{1}{3}}$ ,  $x^{\frac{3}{4}}$ ,  $\sqrt{12x^3y}$ ,  $(3x^3y)^{\frac{1}{4}}$ ,  $\sqrt[3]{25x^2y^4}$ ,  $7(xy)^{\frac{1}{2}}$ ,  $\sqrt{7xy}$ ,  $20^{\frac{3}{4}}$ ,  $\sqrt[4]{20^3}$ ,  $(5x^2y^7)^{\frac{1}{3}}$ ,  $(5x^3y^7)^{\frac{1}{3}}$ ,  $(25x^2y^4)^{\frac{1}{4}}$ ,  $(6xy)^{\frac{1}{3}}$ ,  $(7xy)^{\frac{1}{2}}$ ,  $15$ ,  $20^{\frac{4}{5}}$ ,  $\sqrt[3]{5x^2y^7}$ ,  $(10xy)^{\frac{1}{2}}$ ,  $\sqrt{10^3xy^2}$ ,  $(2xy)^{\frac{1}{3}}$ ,  $\sqrt[3]{6xy}$ ,  $(3x^2y^5)^{\frac{1}{4}}$ ,  $\sqrt[4]{3x^7y^5}$ .

Version 2: Converting Radical Form to Exponential Form

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## Rational Exponents Maze

Directions: Use your knowledge of rational exponents and radicals to simplify each expression. Write each final answer in simplest radical form. Use your solutions to navigate through the maze.

Maze grid for Version 3. Start:  $(x^2)^{\frac{1}{3}}$ . End:  $(x^2)^{\frac{1}{3}}$ .

Expressions in the maze include:  $\sqrt{x^3} \cdot \sqrt[3]{x}$ ,  $4$ ,  $\frac{16^{\frac{3}{4}}}{16^{\frac{1}{4}}}$ ,  $2$ ,  $(x^3)^{\frac{4}{3}}$ ,  $x^2\sqrt{x}$ ,  $(x^2)^{\frac{1}{3}}$ ,  $x^{\frac{4}{5}\sqrt{x}}$ ,  $3x\sqrt{6x^2}$ ,  $3x\sqrt[3]{2x^2}$ ,  $\sqrt[3]{x^4}$ ,  $\sqrt[3]{x^5}$ ,  $x^{\frac{1}{3}\sqrt{3x^2}}$ ,  $x^4\sqrt{x}$ ,  $\frac{\sqrt{2}}{\sqrt[3]{2}}$ ,  $\sqrt[5]{2}$ ,  $\sqrt[3]{54x^5}$ ,  $9x\sqrt[3]{6x^2}$ ,  $(x^2)^{\frac{1}{3}}$ ,  $3x^{\frac{3}{2}\sqrt{x^2}}$ ,  $\frac{3x^2}{x^{\frac{1}{3}}}$ ,  $\sqrt[3]{2}$ ,  $x^2\sqrt[3]{x^2}$ ,  $9x\sqrt[3]{2x^2}$ ,  $125\sqrt[5]{5}$ ,  $5\sqrt[3]{5}$ ,  $\sqrt[3]{20}$ ,  $x^4\sqrt{x^2}$ ,  $\frac{x^2}{\sqrt[3]{x}}$ ,  $x^{\frac{3}{4}\sqrt{x^2}}$ ,  $\frac{6x^{\frac{2}{3}}}{3x^{\frac{1}{3}}}$ ,  $\sqrt[3]{2x}$ ,  $(5^4)^{\frac{1}{3}}$ ,  $x^3\sqrt[4]{x}$ ,  $\frac{\sqrt{x^5}}{\sqrt[3]{x^3}}$ ,  $\sqrt[3]{x^2}$ ,  $\sqrt[3]{x^5}$ ,  $2\sqrt[3]{x}$ ,  $\sqrt[3]{5^3}$ ,  $7x\sqrt[3]{x^3}$ ,  $\sqrt{x}$ ,  $\sqrt[3]{x^2}$ ,  $\frac{81^2}{81^{\frac{1}{4}}}$ ,  $3$ ,  $(\frac{375}{3})^{\frac{1}{3}}$ ,  $14\sqrt[4]{x^7}$ ,  $4x^{\frac{3}{2}} \cdot 3x^{\frac{1}{2}}$ ,  $12x\sqrt[4]{x^3}$ ,  $(x^{\frac{1}{3}})^{\frac{1}{3}}$ ,  $x^{\frac{3}{4}\sqrt{x}}$ ,  $5$ ,  $\sqrt[4]{6}$ ,  $\frac{1}{5}$ ,  $\sqrt{x}$ ,  $\sqrt[4]{x^2}$ ,  $x^6\sqrt{x}$ ,  $\frac{\sqrt[3]{x^4}}{\sqrt{x}}$ ,  $\sqrt[4]{x^5}$ ,  $(36^{\frac{1}{3}})^{\frac{1}{3}}$ ,  $\sqrt{6}$ ,  $(\frac{1}{4})^2$ ,  $\sqrt[4]{x^6}$ ,  $\frac{4x^{\frac{5}{3}}}{4x^{\frac{1}{2}}}$ .

Version 3: Operations with Rational Exponents (Set 1)

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## Rational Exponents Maze

Directions: Use your knowledge of rational exponents and radicals to simplify each expression. Write each final answer in simplest radical form. Use your solutions to navigate through the maze.

Maze grid for Version 4. Start:  $x \cdot x^{\frac{2}{3}}$ . End:  $(x^2)^{\frac{1}{3}}$ .

Expressions in the maze include:  $\sqrt{x^3} \cdot \sqrt[3]{x}$ ,  $\sqrt[3]{xy} \cdot (x^{\frac{1}{2}}y)^3$ ,  $x^4\sqrt{xy}$ ,  $\frac{x^9y^{\frac{5}{2}}}{y^2\sqrt{x}}$ ,  $\sqrt{x^3}y$ ,  $(x^{\frac{3}{10}}y^{\frac{3}{10}})^{\frac{5}{6}}$ ,  $x^5\sqrt[3]{x}$ ,  $\frac{18}{x^2}$ ,  $\frac{6}{x^2}$ ,  $x^8\sqrt{xy}$ ,  $xy\sqrt[3]{x^2y}$ ,  $x^2y^2\sqrt[3]{xy}$ ,  $y\sqrt[3]{xy^2}$ ,  $x \cdot x^{\frac{2}{3}}$ ,  $x^2\sqrt[3]{x}$ ,  $2x^{\frac{7}{3}} \cdot (27x)^{\frac{1}{3}}$ ,  $y\sqrt[3]{x^2y}$ ,  $(x^{\frac{8}{9}}y^{\frac{16}{9}})^{\frac{3}{4}}$ ,  $xy\sqrt[3]{x^2y^2}$ ,  $x^{\frac{7}{3}}y^{\frac{1}{3}} \cdot x^{\frac{4}{3}}y^{\frac{4}{3}}$ ,  $x\sqrt[3]{x^2}$ ,  $x^2\sqrt{x}$ ,  $\frac{1}{6x^2}$ ,  $x^4\sqrt{x}$ ,  $x\sqrt[3]{x^2}$ ,  $\sqrt[3]{x^4}$ ,  $\frac{1}{x}$ ,  $(\frac{5}{4})^{\frac{2}{3}}$ ,  $x^2$ ,  $\frac{x^8}{\sqrt[4]{x^3}}$ ,  $x^7\sqrt[4]{x}$ ,  $\sqrt[3]{x^2} \cdot \sqrt{x}$ ,  $x\sqrt[3]{x}$ ,  $\frac{\sqrt[3]{x^2}}{\sqrt[3]{x^5}}$ ,  $\sqrt{x}$ ,  $x\sqrt{x}$ ,  $3\sqrt[3]{3}$ ,  $9\sqrt[3]{3}$ ,  $8x\sqrt[3]{x}$ ,  $\sqrt[3]{x}$ ,  $x^3$ ,  $\frac{x^2}{x^{\frac{3}{4}}}$ ,  $x^4\sqrt[3]{x}$ ,  $\frac{3^{\frac{7}{2}}}{3^{\frac{1}{2}}}$ ,  $3\sqrt[3]{3}$ ,  $(64x^4)^{\frac{1}{3}}$ ,  $4x\sqrt[3]{x}$ ,  $\frac{5}{x^{\frac{1}{2}}}$ ,  $x\sqrt[3]{x}$ ,  $8x\sqrt{x}$ ,  $9\sqrt{3}$ ,  $3\sqrt{3}$ ,  $8x^2\sqrt[3]{x^2}$ ,  $4x^2\sqrt{x}$ ,  $\sqrt[3]{8}$ ,  $(4x)^{\frac{1}{2}} \cdot (4x)$ ,  $4x^2\sqrt{x}$ ,  $(81^2x^2)^{\frac{1}{4}}$ ,  $9\sqrt{x}$ ,  $x^2 \cdot (8x)^{\frac{2}{3}}$ ,  $4x^2\sqrt[3]{x^2}$ ,  $2^{-1} \cdot 2^{\frac{7}{4}}$ .

Version 4: Operations with Rational Exponents (Set 2)

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