

Radicales

1. Simplifica cada expresión.

$$\begin{aligned} \text{A. } \sqrt[5]{-32} + (-1)^{\frac{2}{3}} \\ = -2 + (-1^3)^{\frac{2}{3}} = -2 + (-1^2) = -2 + (-1) = -3 \end{aligned}$$

$$\begin{aligned} \text{b. } \frac{(-4)^{\frac{1}{2}} - \sqrt[5]{-243}}{\sqrt{121}} \\ = \frac{-(2^2)^{\frac{1}{2}} - (-3)}{11} = \frac{-2+3}{11} = \frac{1}{11} \end{aligned}$$

$$\begin{aligned} \text{c. } \frac{\sqrt{100} - \sqrt[3]{16}}{\sqrt[18]{0}} \\ = \frac{10 - 2}{0} \\ = \frac{8}{0} \end{aligned}$$

$$\begin{aligned} \text{d. } -64^{\frac{1}{3}} \cdot \sqrt{100} \\ = (-2^6)^{\frac{1}{3}} \cdot 10 \\ = (-2^2) \cdot 10 \\ = -4 \cdot 10 \\ = -40 \end{aligned}$$

3. Reduce a índice común los siguientes radicales.

A. $\sqrt[6]{15a^3x^2}$, $\sqrt{2a}$, $\sqrt[3]{3a^2b}$
 $= \sqrt[6]{15a^3x^2} \quad \sqrt[6]{(2a)^3} \quad \sqrt[6]{(3a^2b)^2}$

B. $\sqrt[4]{5}$, $\sqrt{2}$, $\sqrt[3]{3}$, $\sqrt[6]{7}$
 $= \sqrt[12]{(5)^3} \quad \sqrt[12]{(2)^6} \quad \sqrt[12]{(3)^4} \quad \sqrt[12]{(7)^2}$

C. $\sqrt[6]{7a^3b}$, $\sqrt{5x}$, $\sqrt[3]{4x^2-y}$
 $= \sqrt[6]{7a^3b} \quad \sqrt[6]{(5x)^3} \quad \sqrt[6]{(4x^2-y)^2}$

D. $\sqrt[4]{8a^2x^3}$, $\sqrt[5]{3a^5b^4}$
 $= \sqrt[20]{(8a^2x^3)^5} \quad \sqrt[20]{(3a^5b^4)^2}$

E. $\sqrt[5]{3a^2x}$, $\sqrt[3]{2ab}$, $\sqrt[15]{5a^3x^2}$
 $= \sqrt[15]{(3a^2x)^3} \quad \sqrt[15]{(2ab)^5} \quad \sqrt[15]{5a^3x^2}$

5. Racionaliza cada expresión:

A. $\frac{4ab}{\sqrt[3]{x^2y^3z^3b}}$
 $= \frac{4ab}{\sqrt[3]{x^2y^3z^3b}} \cdot \frac{\sqrt[3]{xb^2}}{\sqrt[3]{xb^2}}$
 $= \frac{4ab\sqrt[3]{xb^2}}{\sqrt[3]{x^3y^3z^3b^3}}$

$$= \frac{4ab\sqrt[3]{xb^2}}{xyzb}$$

$$= \frac{4a\sqrt[3]{xb^2}}{xyz}$$

$$B. \frac{h}{\sqrt{x+h} - \sqrt{x}}$$

$$= \frac{h}{\sqrt{x+h} - \sqrt{x}} \cdot \frac{\sqrt{x+h} + \sqrt{x}}{\sqrt{x+h} + \sqrt{x}}$$

$$= \frac{h \cdot (\sqrt{x+h} + \sqrt{x})}{(\sqrt{x+h} - \sqrt{x}) \cdot (\sqrt{x+h} + \sqrt{x})}$$

$$= \frac{h \cdot (\sqrt{x+h} + \sqrt{x})}{x+h-x}$$

$$= \frac{h \cdot (\sqrt{x+h} + \sqrt{x})}{h}$$

$$= \sqrt{x+h} + \sqrt{x}$$

$$C. \frac{m^3 n \sqrt{x}}{\sqrt[5]{2^4 m^7 n^6 x}}$$

$$= mn \frac{m^3 n \sqrt{x}}{\sqrt[5]{2^4 m^2 n x}}$$

$$= \frac{m^2 \sqrt{x}}{\sqrt[5]{2^4 m^2 n x}} \cdot \frac{\sqrt[5]{2 m^3 n^4 x^4}}{\sqrt[5]{2 m^3 n^4 x^4}}$$

$$= \frac{m^2 \sqrt{x} \sqrt[5]{2 m^3 n^4 x^4}}{2 m n x}$$

$$= \frac{m \sqrt{x}}{2nx} \cdot \frac{\sqrt[5]{2m^3n^4x^4}}{2nx}$$

$$d. \frac{\sqrt{m+1}}{1-\sqrt{m+1}}$$

$$= \frac{\sqrt{m+1}}{1-\sqrt{m+1}} \cdot \frac{1+\sqrt{m+1}}{1+\sqrt{m+1}}$$

$$= \frac{\sqrt{m+1} + m+1}{1-(m+1)}$$

$$= \frac{\sqrt{m+1} + m+1}{1-m-1}$$

$$= \frac{\sqrt{m+1} + m+1}{-m}$$

$$= \frac{\sqrt{m+1} + m+1}{m}$$

$$e. \frac{3ab^2}{\sqrt{ab^3}}$$

$$= \frac{3ab^2}{b^2 \sqrt{ab}}$$

$$= \frac{3a}{\sqrt{ab}}$$

$$= \frac{3a}{\sqrt{ab}} \cdot \frac{\sqrt{ab}}{\sqrt{ab}}$$

$$= \frac{3a \sqrt{ab}}{ab}$$

$$= \frac{3 \sqrt{ab}}{ab}$$

$$F. \frac{x}{\sqrt{x^2+1}-x}$$

$$= \frac{x}{\sqrt{x^2+1}-x} \cdot \frac{\sqrt{x^2+1}+x}{\sqrt{x^2+1}+x}$$

$$= \frac{x \cdot (\sqrt{x^2+1}+x)}{x^2+1-x^2}$$

$$= \frac{x \cdot (\sqrt{x^2+1}+x)}{1}$$

$$= x \cdot \sqrt{x^2+1} + x^2$$

$$9. \frac{\sqrt{1+x}}{\sqrt{1-x}}$$

$$= \frac{\sqrt{1+x}}{\sqrt{1-x}} \cdot \frac{\sqrt{1-x}}{\sqrt{1-x}}$$

$$= \frac{\sqrt{(1+x) \cdot (1-x)}}{1-x}$$

$$= \frac{\sqrt{1-x^2}}{1-x}$$

$$h. \frac{2}{\sqrt{2+\sqrt{2}} - \sqrt{2}}$$

$$= \frac{2}{\sqrt{2+\sqrt{2}} - \sqrt{2}} \cdot \frac{\sqrt{2+\sqrt{2}} + \sqrt{2}}{\sqrt{2+\sqrt{2}} + \sqrt{2}}$$

$$= \frac{2\sqrt{2+\sqrt{2}} + 2\sqrt{2}}{2+\sqrt{2}-2}$$

$$= \frac{2\sqrt{2+\sqrt{2}} + 2\sqrt{2}}{\sqrt{2}}$$

6.

$$t = \frac{1}{4} d^{\frac{1}{2}}$$

$$t = \frac{1}{4} (100^{\frac{1}{2}})$$

$$t = \frac{1}{4} \cdot (10^2)^{\frac{1}{2}}$$

$$t = \frac{1}{4} \cdot 10$$

$$t = \frac{1}{2} \cdot 5$$

$$t = \frac{5}{2}$$

$$t = 2,5 \text{ segundos}$$

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$$r = \left(\frac{A}{4\pi} \right)^{\frac{1}{2}}$$

$$r = \sqrt{\frac{A}{4\pi}}$$

$$r = \sqrt{\frac{64\pi}{4\pi}}$$

$$r = \sqrt{16}$$

$$r = 4$$

Evaluación

n	$\frac{1}{2^n}$	$\left(\frac{1}{2}\right)^{\frac{1}{n}}$
1	2	$\frac{1}{2}$
2	$\sqrt{\frac{1}{2}}$	$\frac{\sqrt{2}}{2}$
5	$\sqrt[5]{\frac{1}{2}}$	$\sqrt[5]{\frac{1}{2}}$
10	$\sqrt[10]{\frac{1}{2}}$	$\sqrt[10]{\frac{1}{2}}$
100	$\sqrt[100]{\frac{1}{2}}$	$\sqrt[100]{\frac{1}{2}}$

A. B/ El resultado cada vez es menor.

B. B/ El resultado cada vez aumenta.

ii. Escribe F si la proporsicion es falsa o V si es verdadera

$$A = F$$

$$b = F$$

$$c = V$$

$$d = F$$