① $\dfrac{22^{44}}{44^{22}} \Rightarrow \dfrac{22^{44}}{2^{22}\cdot 22^{22}} \Rightarrow \dfrac{22^{22}}{2^{22}} \Rightarrow \dfrac{2^{22}\cdot 11^{22}}{2^{22}} = 11^{22}$

simplify; simplify; simplify reduce to 1

② $\sqrt{48}+\sqrt{243}+\sqrt{3x}=\sqrt{27}$

$\sqrt{16\cdot 3}+\sqrt{81\cdot 3}+\sqrt{3x}=\sqrt{9\cdot 3}$

$4\sqrt{3}+9\sqrt{3}+\sqrt{3x}=3\sqrt{3}$

combine like

$13\sqrt{3}+\sqrt{3x}=3\sqrt{3}$

$-13\sqrt{3} \qquad -13\sqrt{3}$

$(\sqrt{3x})^2=(-10\sqrt{3})^2$

$\dfrac{3x}{3}=\dfrac{300}{3}$

$x=100$

check

$\sqrt{48}+\sqrt{243}+\sqrt{300} \stackrel{?}{=} \sqrt{27}$

$4\sqrt{3}+9\sqrt{3}+10\sqrt{3} \stackrel{?}{=} 3\sqrt{3}$

$23\sqrt{3} \stackrel{?}{=} 3\sqrt{3}$

No

No Solution

③ Rewrite as

$\sqrt{\dfrac{18}{32}}+\sqrt[3]{\dfrac{4}{32}}-\sqrt[5]{\dfrac{2}{64}}$

Simplify (reduce) fraction and then split back up

$\dfrac{\sqrt{9}}{\sqrt{16}}+\dfrac{\sqrt[3]{1}}{\sqrt[3]{8}}-\dfrac{\sqrt[5]{1}}{\sqrt[5]{32}}$

everything becomes rational

$\dfrac{3}{4}+\dfrac{1}{2}-\dfrac{1}{2}$

zero out

$\dfrac{3}{4}$