

$$\begin{aligned}
 2 \textcircled{x} \quad \frac{a^5}{a^3} \times a^2 \\
 &= a^{5-3} \times a^2 \\
 &= a^2 \times a^2 \\
 &= a^{2+2} \\
 &= a^4
 \end{aligned}$$

$$\begin{aligned}
 2 \textcircled{x} \textcircled{i} \quad \frac{4^5 \times a^8 b^3}{4^5 \times a^5 b^2} \\
 &= a^{8-5} b^{3-2} \\
 &= a^3 b
 \end{aligned}$$

$$\begin{aligned}
 2 \textcircled{x} \textcircled{ii} \quad (2^3 \times 2)^2 \\
 &= (2^{3+1})^2 \\
 &= (2^4)^2 \\
 &= 2^8
 \end{aligned}$$

$$\begin{aligned}
 3 \textcircled{ii} \quad 2^3 > 5^2 \\
 \text{LHS} &= 2^3 = 8 \\
 \text{RHS} &= 5^2 = 25 \\
 \therefore 2^3 &\neq 5^2 \quad \text{False}
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{iii} \quad 2^3 \times 3^2 = 6^5 \\
 \text{LHS} &= 2^3 \times 3^2 \\
 \text{RHS} &= 6^5 \\
 &= (2 \times 3)^5 \\
 &= 2^5 \times 3^5 \\
 \therefore 2^3 \times 3^2 &\neq 6^5 \\
 &\quad \text{False}
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{iv} \quad \text{LHS} &= 3^0 = 1 \\
 \text{RHS} &= 1000^0 = 1 \\
 \therefore 3^0 &= 1000^0
 \end{aligned}$$

$$\begin{aligned}
 3 \textcircled{i} \quad 10 \times 10'' = 100'' \\
 \text{LHS} &= 10 \times 10'' \\
 &= 10^{1+1} \\
 &= 10^{12}
 \end{aligned}$$

$$\begin{aligned}
 \text{RHS} &= 100'' \\
 &= (10^2)'' \\
 &= 10^{2 \times 11} \\
 &= 10^{22}
 \end{aligned}$$

$$\therefore 10 \times 10'' \neq 100'' \quad \text{False}$$