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$$\begin{aligned} \text{a)} \quad (2 \cdot x^4)^3 + 2(x^4)^3 &= 2^3 \cdot x^{4 \cdot 3} + 2 \cdot x^{4 \cdot 3} \\ &= 8x^{12} + 2x^{12} = 10x^{12} \end{aligned}$$

$$\text{b)} \quad \left( \frac{2a}{b^2} \right)^2 = \frac{2a}{b^2} \cdot \frac{2a}{b^2} = \frac{4a^2}{b^4}$$

$$\text{c)} \quad x^{\frac{1}{2}} \cdot x^{\frac{1}{3}} = x^{\frac{1}{2} + \frac{1}{3}} = x^{\frac{3}{6} + \frac{2}{6}} = x^{\frac{5}{6}}$$

$$\text{d)} \quad \frac{x^{n/2}}{x^{m/3}} = x^{\frac{n}{2} - \frac{m}{3}} = x^{\frac{3n}{6} - \frac{2m}{6}} = x^{n/6}$$