

Conditions

$$\left(\frac{1}{3}\right)\left((2x^2)^{-\frac{2}{3}}\right) \cdot (4x) + \left(\frac{1}{2}\right)\left((3x)^{-\frac{3}{2}}\right) \cdot (3)$$

Solution

Consider the expression:

$$\frac{1}{3}(2x^2)^{-\frac{2}{3}} \cdot 4x + \frac{1}{2}(3x)^{-\frac{3}{2}} \cdot 3$$

$$\frac{1}{3}(2x^2)^{-\frac{2}{3}} \cdot 4x = \frac{4x}{3}(2x^2)^{-\frac{2}{3}} = \frac{4x}{3} \cdot 2^{-\frac{2}{3}} \cdot x^{2 \cdot -\frac{2}{3}} = \frac{4x}{3} \cdot \frac{1}{\sqrt[3]{4}} \frac{1}{x^{\frac{4}{3}}} = \frac{\sqrt[3]{4^2}}{3\sqrt[3]{x}} = \frac{2\sqrt[3]{2}}{3\sqrt[3]{x}}$$

$$\frac{1}{2}(3x)^{-\frac{3}{2}} \cdot 3 = \frac{3}{2} \cdot \frac{1}{3x\sqrt{3x}} = \frac{1}{2x\sqrt{3x}}$$

$$\frac{2\sqrt[3]{2}}{3\sqrt[3]{x}} + \frac{1}{2x\sqrt{3x}} = \frac{4\sqrt[3]{2x^6} + \sqrt{3}}{6x\sqrt{x}}$$