

# R12 Model solutions

Monday, November 7, 2022 10:52 AM

Indefinite integrals:

$$4.9.23 \quad I = \int (3x^{1/3} + 4x^{-1/3} + 6) dx$$

Sum rule:  $\int [f(x) + g(x)] dx = \int f(x) dx + \int g(x) dx$ ; Const rule  $\int c \cdot f(x) dx = c \int f(x) dx \Rightarrow$

$$I = 3 \int x^{1/3} dx + 4 \int x^{-1/3} dx + 6 \int dx \quad \Rightarrow$$

$$\int x^\alpha dx = \frac{1}{\alpha+1} x^{\alpha+1} \quad \text{for } \alpha \neq -1$$

$$I = 3 \frac{x^{4/3}}{\frac{4}{3}} + 4 \frac{x^{2/3}}{\frac{2}{3}} + 6x + C = \frac{9}{4} x^{4/3} + 6x^{2/3} + 6x + C$$

Check in Wolfram Alpha:

The screenshot shows the Wolfram Alpha interface. At the top, the input is  $\int (3x^{1/3} + 4x^{-1/3} + 6) dx$ . Below the input are buttons for "NATURAL LANGUAGE" and "MATH INPUT". A "BASIC MATH" keypad is visible with various mathematical symbols. The result is displayed as "Indefinite integral" and the equation  $\int (3\sqrt[3]{x} + 4x^{-1/3} + 6) dx = \frac{9x^{4/3}}{4} + 6x^{2/3} + 6x + \text{constant}$ .

Screen clipping taken: 11/11/2022 12:23 PM