

Answer on Question #76461 – Math – Calculus

Question

Evaluate the following integrals.

a)  $\int_1^4 \sqrt{\frac{5}{x}} dx$

b)  $\int_1^9 \frac{3x-2}{\sqrt{x}} dx$

Solution

$$\int_1^4 \sqrt{\frac{5}{x}} dx = \sqrt{5} \int_1^4 \frac{1}{\sqrt{x}} dx = 2 \cdot \sqrt{5} \cdot \sqrt{x} \Big|_1^4 = 2\sqrt{5}(2-1) = 2\sqrt{5}$$

$$\int_1^9 \frac{3x-2}{\sqrt{x}} dx = 3 \int_1^9 \sqrt{x} dx - 2 \int_1^9 \frac{1}{\sqrt{x}} dx = \frac{3 \cdot 2}{3} \cdot x^{\frac{3}{2}} \Big|_1^9 - 4\sqrt{x} \Big|_1^9 = 2(27-1) - 4(3-1) = 54 - 2 - 12 + 4 = 44$$

**Answer:** a)  $\int_1^4 \sqrt{\frac{5}{x}} dx = 2\sqrt{5}$ ; b)  $\int_1^9 \frac{3x-2}{\sqrt{x}} dx = 44$ .