

$$\int_4^9 \sqrt{x} \, dx = \int_4^9 x^{1/2} \, dx = \left[\frac{x^{3/2}}{3/2} \right]_4^9 = \frac{2}{3} [x^{3/2}]_4^9 = \frac{2}{3} (9^{3/2} - 4^{3/2}) = \frac{2}{3} (27 - 8) = \frac{38}{3}$$