Rep.kurs i 5B1115 Matematik II

Lösning LS5 15/6 04

Höger (grön):$A = \int_4^5 (x-4)\sqrt{5-x}\ dx$

Vänster (gul): $A = \int_3^4 (x-3)\sqrt{4-x}\ dx$

Substitutionen $t = 5-x,\ dt = -dx$ resp. $t = 4-x,\ dt = -dx$
ger i båda fallen integralen

$$A = \int_1^0 (1-t)\sqrt{t}(-dt) = \int_0^1 (1-t)\sqrt{t}\ dt =$$

$$\int_0^1 (t^{1/2} - t^{3/2})dt = \left[\frac{t^{3/2}}{3/2} - \frac{t^{5/2}}{5/2}\right]_0^1 =$$

$$\frac{2}{3} - \frac{2}{5} = \underline{\frac{4}{15}}.$$

Anm: Substitutionerna $t^2 = 5-x$ resp. $t^2 = 4-x$ kan också användas.