

$$\underbrace{\int_0^1 dy \int_{1-\sqrt{y}}^{1+\sqrt{y}} f(x, y) dx}_{\text{blue}} + \underbrace{\int_1^4 dy \int_{y-1}^{1+\sqrt{y}} f(x, y) dx}_{\text{green}} = \int_0^3 dx \int_{(x-1)^2}^{x+1} f(x, y) dy$$

