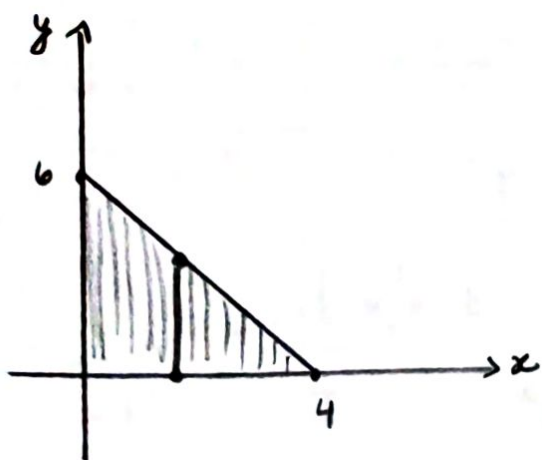


$$(37) f(x, y) = \frac{12 - 3x - 2y}{4}$$



$$y = ax + b$$

$$a = \frac{y_2 - y_1}{x_2 - x_1}$$

$$a = \frac{0 - 6}{4 - 0} \Rightarrow a = \frac{-6}{4} \Rightarrow a = -\frac{3}{2}$$

$$y = -\frac{3}{2}x + 6$$

$$\int_0^4 \int_0^{-\frac{3}{2}x + 6} \left(\frac{12 - 3x - 2y}{4} \right) dy dx$$

$$\frac{1}{4} \int 12 - 3x - 2y dx \Rightarrow \frac{1}{4} \left(12y - 3xy - \frac{y^2}{2} \right)$$

$$= 3y - \frac{3xy}{4} - \frac{y^2}{4} \Bigg|_0^{-\frac{3}{2}x + 6}$$

$$= 3 \left(-\frac{3}{2}x + 6 \right) - \frac{3x}{4} \left(-\frac{3}{2}x + 6 \right) - \frac{1}{4} \left(-\frac{3}{2}x + 6 \right)^2 - 0$$

$$= -\frac{9x}{2} + 18 + \frac{9x^2}{8} - \frac{9}{2}x - \frac{\left(-\frac{3x}{2} + 6 \right)^2}{4}$$

$$= -\frac{9x}{2} + 18 + \frac{9x^2}{8} - \frac{9}{2}x - \frac{\left(-\frac{3x+12}{2}\right)^2}{4}$$

$$= -\frac{9x}{2} + 18 + \frac{9x^2}{8} - \frac{9}{2}x - \frac{(-3x+12)^2}{4 \cdot 4}$$

$$= -\frac{9x}{2} + 18 + \frac{9x^2}{8} - \frac{9x}{2} - \frac{144 - 72x + 9x^2}{16}$$

$$= -9x + 18 + \frac{9x^2}{8} - \frac{144 - 72x + 9x^2}{16}$$

$$= \frac{-144x + 288 + 18x^2 - 144 + 72x - 9x^2}{16}$$

$$= \frac{-72x + 144 + 9x^2}{16}$$

$$\int_0^4 \frac{9x^2 - 72x + 144}{16} dx$$

$$= \frac{9}{16} \int x^2 - 8x + 16 \, dx$$

$$= \frac{9}{16} \cdot \left(\frac{x^3}{3} - 4x^2 + 16x \right)$$

$$= \frac{3x^3}{16} - \frac{9x^2}{4} + 9x \Big|_0^4$$

$$= \frac{3}{16} \cdot (4)^3 - \frac{9}{4} (4)^2 + 9(4)$$

$$= \frac{3}{4^2} \cdot (4)^3 - 9 \cdot 4 + 36$$

$$= 3 \cdot 4 - \cancel{36} + \cancel{36}$$

$$= 12 //$$