

$$14 \iint_R (x - 3y^2) \cdot dA, \text{ onde } R(x, y) | 0 \leq x \leq 2; 1 \leq y \leq 2$$

$$\int_1^2 \int_0^2 (x - 3y^2) \cdot dx \cdot dy$$

$$\int_1^2 dy \int_0^2 (x - 3y^2) \cdot dx$$

$$\int_1^2 dy \left[ \frac{x^2}{2} - 3y^2 \cdot x \right]_0^2$$

$$\int_1^2 dy \left[ \frac{2^2}{2} - 3y^2 \cdot 2 \right] - [0]$$

$$\int_1^2 dy [2 - 6y^2]$$

$$\int_1^2 2 - 6y^2 \cdot dy$$

$$\int_1^2 (2 - 6y^2) \cdot dy =$$

$$\left[ 2y - \frac{6y^3}{3} \right]_1^2 = \left[ 2 \cdot 2 - \frac{6 \cdot 2^3}{3} \right] - \left[ 2 \cdot 1 - \frac{6 \cdot 1^3}{3} \right]$$

$$[4 - 16] - [2 - 2] = [12]$$



$$12) \int_0^3 \int_0^2 (4 - y^2) dy \cdot dx$$

$$\int_0^3 1 dx \int_0^2 (4 - y^2) dy$$

$$\int_0^3 dx \int_0^2 \left[ 4y - \frac{y^3}{3} \right]_0^2$$

$$\int_0^3 dx \left[ 4 \cdot 2 - \frac{2^3}{3} \right] - [0]$$

$$\int_0^3 dx \left[ 8 - \frac{8}{3} \right] = \frac{24 - 8}{3} = \frac{16}{3}$$

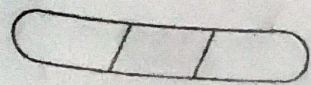
$$\int_0^3 dx \cdot \frac{16}{3} dx$$

$$\int_0^3 \left[ \frac{16}{3} x \right]_0^3 =$$

$$\left[ \frac{16 \cdot 3}{3} \right] - [0]$$

$$\int_0^3 16$$





$$13) \iint_D e^{y^2} dA \quad D = (x, y) / 0 \leq y \leq 1, 0 \leq x \leq y$$

$$\int_0^1 \int_0^y e^{y^2} dx \cdot dy$$

$$\int_0^1 dy \int_0^y e^{y^2} dx$$

$$\int_0^1 dy \left[ e^{y^2} \cdot x \right]_0^y$$

$$\int_0^1 dy \left[ e^{y^2} \cdot y \right] \cdot [0]$$

$$\int_0^1 dy \cdot [e^{y^2} \cdot y] = e^{y^2} \cdot y \cdot dy = e^u \cdot \frac{du}{2}$$

$$\int_0^1 e^{y^2} \cdot \frac{du}{2} \Big|_0^1$$

$$\begin{aligned} u &= y^2 \\ u' &= 2y \cdot dy \\ \frac{du}{2} &= y \cdot dy \end{aligned}$$

$$\frac{1}{2} \left[ e^{y^2} \right]_0^1 = \frac{1}{2} (e^{1^2} - e^{0^2})$$

$$\frac{1}{2} [e - 1] = \frac{1}{2} [2.7183 - 1] = \boxed{0.8591}$$



$$16) \int_0^2 \int_{x+1}^{x^2+4} 1 \, dy \, dx$$

$$\int_0^2 dx \int_{x+1}^{x^2+4} 1$$

$$\int_0^2 dx \int_{x+1}^{x^2+4} dy$$

$$\int_0^2 dx [y]_{x+1}^{x^2+4}$$

$$\int_0^2 dx [(x^2+4) - (x+1)]$$

$$\int_0^2 dx [x^2 + 4 - x - 1]$$

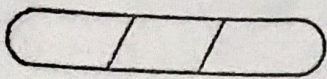
$$\int_0^2 (x^2 - x + 3) \cdot dx$$

$$\left[ \frac{x^3}{3} - \frac{x^2}{2} + 3x \right]_0^2$$

$$\left[ \frac{(2)^3}{3} - \frac{(2)^2}{2} + 3(2) \right] - [0]$$

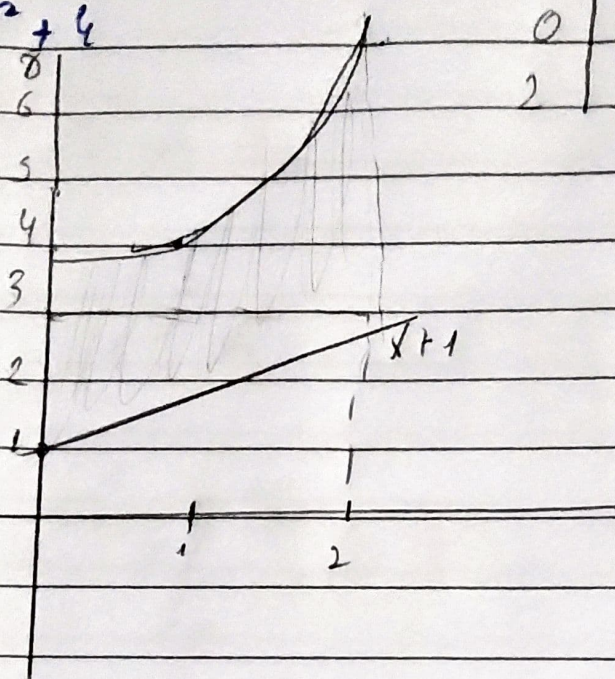
$$\left[ \frac{16 - 12 + 36}{6} \right] = \frac{40}{6} = \boxed{6.67}$$





$$f(x) = x + 1$$

$$g(x) = x^2 + 4$$



x	y
0	1
2	3

x	y
0	4
1	5
2	8