

1. Calculați:

$$\text{a) } \int x^3 + x^2 + \cos(x) \, dx \quad \text{b) } \int x^7 - 4x^3 + \sin(x) \, dx \quad \text{c) } \int x^6 + 2x^3 + e^x \, dx \quad \text{d) } \int x^5 - 7x^4 + 3^x \, dx$$

2. Calculați:

$$\text{a) } \int_0^{\pi/2} x^2 \cdot \cos(x) \, dx \quad \text{b) } \int_0^{\pi/2} x^2 \cdot \sin(x) \, dx \quad \text{c) } \int_1^{\ln(2)} x^2 \cdot e^x \, dx \quad \text{d) } \int_1^{e^3} x^2 \cdot \ln(x) \, dx$$

3. Calculați:

$$\text{a) } \int_{\pi/6}^{\pi/3} \sin^5(3x) \cdot \cos(3x) \, dx \quad \text{b) } \int_{\pi/8}^{\pi/4} \sin^7(4x) \cdot \cos(4x) \, dx \quad \text{c) } \int_{\pi/20}^{\pi/10} \cos^5(5x) \cdot \sin(5x) \, dx \quad \text{d) } \int_{\pi/6}^{\pi/3} \cos^7(3x) \cdot \sin(3x) \, dx$$

4. Fie $D = \{(x, y) \in \mathbb{R}^2 \mid 0 \leq x \leq 2, 1 \leq y \leq 3\}$. Calculați:

$$\text{a) } \iint_D x \, dx dy \quad \text{b) } \iint_D y \, dx dy \quad \text{c) } \iint_D x^2 \, dx dy \quad \text{d) } \iint_D y^3 \, dx dy$$

5. Fie $D = \{(x, y) \in \mathbb{R}^2 \mid -1 \leq x \leq 1, 0 \leq y \leq 4\}$. Calculați:

$$\text{a) } \iint_D x \, dx dy \quad \text{b) } \iint_D y \, dx dy \quad \text{c) } \iint_D x^2 \, dx dy \quad \text{d) } \iint_D y^3 \, dx dy$$

6. Fie $D = \{(x, y) \in \mathbb{R}^2 \mid 0 \leq x \leq 1, x \leq y \leq 3x\}$. Calculați:

$$\text{a) } \iint_D x + 2y \, dx dy \quad \text{b) } \iint_D x^2 + y \, dx dy \quad \text{c) } \iint_D x + y^3 \, dx dy$$

7. Fie $D = \{(x, y) \in \mathbb{R}^2 \mid 1 \leq x \leq 2, x^2 \leq y \leq 3x^3\}$. Calculați:

$$\text{a) } \iint_D x + 2y \, dx dy \quad \text{b) } \iint_D x^2 + y \, dx dy \quad \text{c) } \iint_D x + y^3 \, dx dy$$

8. Fie $D = \{(x, y) \in \mathbb{R}^2 \mid y \leq x \leq 5y, 2 \leq y \leq 3\}$. Calculați:

$$\text{a) } \iint_D 2x + y \, dx dy \quad \text{b) } \iint_D x^2 + y^2 \, dx dy \quad \text{c) } \iint_D x^3 + y^3 \, dx dy$$

9. Fie $D = \{(x, y) \in \mathbb{R}^2 \mid y^3 \leq x \leq 5y^4, 2 \leq y \leq 3\}$. Calculați:

$$\text{a) } \iint_D 2x + y \, dx dy \quad \text{b) } \iint_D x^2 + y^2 \, dx dy \quad \text{c) } \iint_D x^3 + y^3 \, dx dy$$

10. Fie $D = \{(x, y) \in \mathbb{R}^2 \mid x^2 + y^2 \leq 25\}$. Calculați:

$$\text{a) } \iint_D 1 \, dx dy \quad \text{b) } \iint_D 2x \, dx dy \quad \text{c) } \iint_D 2y \, dx dy$$

11. Fie $D = \{(x, y) \in \mathbb{R}^2 \mid 16 \leq x^2 + y^2 \leq 25\}$. Calculaţi:

a) $\iint_D 1 \, dx dy$

b) $\iint_D 2x \, dx dy$

c) $\iint_D 2y \, dx dy$

12. Fie $D = \{(x, y) \in \mathbb{R}^2 \mid 9 \leq x^2 + y^2 \leq 36\}$. Calculaţi:

a) $\iint_D 1 \, dx dy$

b) $\iint_D 2x \, dx dy$

c) $\iint_D 2y \, dx dy$

13. Fie $D = \{(x, y, z) \in \mathbb{R}^3 \mid 1 \leq x \leq 2, 2 \leq y \leq 3, 3 \leq z \leq 4\}$. Calculaţi:

a) $\iiint_D 1 \, dx dy dz$

b) $\iiint_D x + 2y \, dx dy dz$

c) $\iiint_D x + 2y + 3z \, dx dy dz$

14. Fie $D = \{(x, y, z) \in \mathbb{R}^3 \mid 0 \leq x \leq 1, 1 \leq y \leq 2, 2 \leq z \leq 3\}$. Calculaţi:

a) $\iiint_D 1 \, dx dy dz$

b) $\iiint_D 2x + 3y^2 \, dx dy dz$

c) $\iiint_D xyz \, dx dy dz$

15. Fie $D = \{(x, y, z) \in \mathbb{R}^3 \mid 0 \leq x \leq 2, 2 \leq y \leq 4, 4 \leq z \leq 6\}$. Calculaţi:

a) $\iiint_D x + yz \, dx dy dz$

b) $\iiint_D y + xz \, dx dy dz$

c) $\iiint_D z + xy \, dx dy dz$

16. Fie $D = \{(x, y, z) \in \mathbb{R}^3 \mid 0 \leq x \leq 2, 2 \leq y \leq 4, 4 \leq z \leq 6\}$. Calculaţi:

a) $\iiint_D x + yz \, dx dy dz$

b) $\iiint_D y + xz \, dx dy dz$

c) $\iiint_D z + xy \, dx dy dz$

17. Fie $D = \{(x, y, z) \in \mathbb{R}^3 \mid x^2 + y^2 \leq 16, z \in [0, 1]\}$. Calculaţi:

a) $\iiint_D 1 \, dx dy dz$

b) $\iiint_D x \, dx dy dz$

c) $\iiint_D x^2 + y^2 \, dx dy dz$

18. Fie $D = \{(x, y, z) \in \mathbb{R}^3 \mid x^2 + y^2 \leq 16, z \in [0, 1]\}$. Calculaţi:

a) $\iiint_D 1 \, dx dy dz$

b) $\iiint_D 2x \, dx dy dz$

c) $\iiint_D x^2 + y^2 \, dx dy dz$

19. Fie $D = \{(x, y, z) \in \mathbb{R}^3 \mid x^2 + z^2 \leq 16, y \in [0, 1]\}$. Calculaţi:

a) $\iiint_D 1 \, dx dy dz$

b) $\iiint_D 2y \, dx dy dz$

c) $\iiint_D x^2 + z^2 \, dx dy dz$

20. Fie $D = \{(x, y, z) \in \mathbb{R}^3 \mid (y - 1)^2 + z^2 \leq 16, x \in [0, 1]\}$. Calculaţi:

a) $\iiint_D 1 \, dx dy dz$

b) $\iiint_D 2x \, dx dy dz$

c) $\iiint_D y^2 + z^2 \, dx dy dz$

21. Fie $D = \{(x, y, z) \in \mathbb{R}^3 \mid x^2 + (z - 1)^2 \leq 9, y \in [0, 1]\}$. Calculaţi:

a) $\iiint_D 1 \, dx dy dz$

b) $\iiint_D 2x \, dx dy dz$

c) $\iiint_D x^2 + z^2 \, dx dy dz$