

Zadatak 3. Odredi:

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| 1) $\int (2-3x+x^2)dx;$ | 2) $\int x(3x-2)^2dx;$ |
| 3) $\int \frac{x^4-1}{x^2}dx;$ | 4) $\int \frac{2\pi-x^3}{x^2}dx;$ |
| 5) $\int \frac{x^3-1}{2x^2}dx;$ | 6) $\int \frac{(\sqrt{x}-1)^2}{x^3}dx;$ |
| 7) $\int \frac{x^3-\sqrt[3]{x}}{x^2}dx;$ | 8) $\int \frac{1-\sqrt{x}}{x\sqrt{x}}dx;$ |
| 9) $\int \frac{2x^2+3x-1}{x}dx;$ | 10) $\int \frac{(x-3)^2}{x^5}dx.$ |

Rješenje.

- 1) $\int (2-3x+x^2)dx = 2x - 3\frac{x^2}{2} + \frac{x^3}{3} + C = 2x - \frac{3}{2}x^2 + \frac{1}{3}x^3 + C;$
- 2) $\int x(3x-2)^2dx = \int x(9x^2-12x+4)dx = \int (9x^3-12x^2+4x)dx = 9\frac{x^4}{4} - 12\frac{x^3}{3} + 4\frac{x^2}{2} + C = \frac{9}{4}x^4 - 4x^3 + 2x^2 + C;$
- 3) $\int \frac{x^4-1}{x^2}dx = \int (x^2 - \frac{1}{x^2})dx = \int (x^2 - x^{-2})dx = \frac{x^3}{3} - \frac{x^{-1}}{-1} + C = \frac{1}{3}x^3 + \frac{1}{x} + C;$
- 4) $\int \frac{2\pi-x^3}{x^2}dx = \int (2\pi x^{-2} - x)dx = 2\pi \frac{x^{-1}}{-1} - \frac{x^2}{2} + C = -\frac{2\pi}{x} - \frac{x^2}{2} + C;$
- 5) $\int \frac{x^3-1}{2x^2}dx = \int (\frac{x}{2} - \frac{1}{2x^2})dx = \frac{1}{2} \int x dx - \frac{1}{2} \int (\frac{dx}{x^2}) = \frac{1}{2} \cdot \frac{x^2}{2} - \frac{1}{2} \cdot \frac{x^{-1}}{-1} + C = \frac{x^2}{4} + \frac{1}{2x} + C;$
- 6) $\int \frac{(\sqrt{x}-1)^2}{x^3}dx = \int \frac{x-2\sqrt{x}+1}{x^3}dx = \int (x^{-2} - 2x^{-\frac{5}{2}} + x^{-3})dx = \frac{x^{-1}}{-1} - 2\frac{x^{-\frac{3}{2}}}{-\frac{3}{2}} + \frac{x^{-2}}{-2} + C = -\frac{1}{x} + \frac{4}{3} \cdot \frac{1}{x\sqrt{x}} - \frac{1}{2x^2} + C;$
- 7) $\int \frac{x^3-\sqrt[3]{x}}{x^2}dx = \int (x-x^{-\frac{5}{3}})dx = \frac{x^2}{2} - \frac{x^{-\frac{2}{3}}}{-\frac{2}{3}} + C = \frac{x^2}{2} + \frac{3}{2} \cdot \frac{1}{\sqrt[3]{x^2}} + C;$
- 8) $\int \frac{1-\sqrt{x}}{x\sqrt{x}}dx = \int \frac{1-x^{\frac{1}{2}}}{x^{\frac{3}{2}}}dx = \int (x^{-\frac{3}{2}} - x^{-1})dx = \frac{x^{-\frac{1}{2}}}{-\frac{1}{2}} - \ln|x| + C = -\frac{2}{\sqrt{x}} - \ln|x| + C;$
- 9) $\int \frac{2x^2+3x-1}{x}dx = \int (2x+3-\frac{1}{x})dx = x^2+3x-\ln|x|+C;$
- 10) $\int \frac{(x-3)^2}{x^5}dx = \int \frac{x^2-6x+9}{x^5}dx = \int (x^{-3}-6x^{-4}+9x^{-5})dx =$

$$\frac{x^{-2}}{-2} - 6\frac{x^{-3}}{-3} + 9\frac{x^{-4}}{-4} + C = -\frac{1}{2x^2} + \frac{2}{x^3} - \frac{9}{4x^4} + C.$$