

Card N 1

1. Calculate the following indefinite integrals in direct way

$$\text{a) } \int (3x^2 + 2\sin x) dx, \quad \text{b) } \int \left(7\sqrt[5]{x} - \frac{1}{\sqrt{1-x^2}} \right) dx, \quad \text{c) } \int (5x^3 + \cos x) dx, \quad \text{d) } \int \left(\frac{1}{x^2} + \frac{1}{\sqrt{x^2-1}} \right) dx$$

$$\text{e) } \int \left(4e^x + \frac{1}{\cos^2 x} \right) dx, \quad \text{f) } \int \left(\frac{5}{x} + \frac{1}{3+x^2} \right) dx, \quad \text{g) } \int \left(3^x + \frac{1}{\sin^2 x} \right) dx, \quad \text{h) } \int \left(\frac{3}{\sqrt{9-x^2}} + \frac{2}{\sqrt[5]{x}} \right) dx$$

$$\text{i) } \int (4\sqrt{x^3} - 5e^x) dx, \quad \text{l) } \int \left(4\sin 2x + \frac{1}{1-x^2} \right) dx, \quad \text{m) } \int \left(4\tan x + \frac{1}{25+x^2} \right) dx, \quad \text{n) } \int ((3x+7) + e^{3x}) dx$$

2. Calculate the following integrals applying the different approaches

$$\text{a) } \int \frac{x}{1+x^4} dx, \quad \text{a),} \quad \text{b) } \int xe^{3x} dx, \quad \text{c) } \int \frac{\sin^4 x}{\cos^6 x} dx, \quad \text{d) } \int \frac{x}{1+\sqrt{1+x}} dx,$$

$$\text{e) } \int \sqrt{4-x^2} dx, \quad \text{f) } \int \frac{1}{\cos^2 x + 3\cos x \sin x + 2\sin^2 x} dx, \quad \text{g) } \int \frac{x+2}{2+2x+x^2} dx, \quad \text{h) } \int \frac{\ln \ln x}{x} dx$$

Card N 2

1. Calculate the following indefinite integrals in direct way

$$\text{a) } \int \left(4e^x + \frac{1}{\cos^2 x} \right) dx, \quad \text{b) } \int \left(\frac{5}{x} + \frac{1}{3+x^2} \right) dx, \quad \text{c) } \int \left(3^x + \frac{1}{\sin^2 x} \right) dx, \quad \text{d) } \int \left(\frac{3}{\sqrt{9-x^2}} + \frac{2}{\sqrt[5]{x}} \right) dx$$

$$\text{e) } \int (3x^2 + 2\sin x) dx, \quad \text{f) } \int \left(7\sqrt[5]{x} - \frac{1}{\sqrt{1-x^2}} \right) dx, \quad \text{g) } \int (5x^3 + \cos x) dx, \quad \text{h) } \int \left(\frac{1}{x^2} + \frac{1}{\sqrt{x^2-1}} \right) dx$$

$$\text{i) } \int \left(2\sqrt{x^3} + \frac{1}{4+x^2} \right) dx, \quad \text{l) } \int \left(4\sin 3x + \frac{1}{1-x^2} \right) dx, \quad \text{m) } \int \left(4\tan x - \frac{3}{1+x^2} \right) dx, \quad \text{n) } \int ((3x+7) + e^{3x}) dx$$

2. Calculate the following integrals applying the different approaches

$$\text{a) } \int \frac{e^{\cot x}}{\sin^2 x} dx, \quad \text{b) } \int \cos^3 x \sin^{12} x dx, \quad \text{c) } \int \frac{x^3 dx}{1+x^4}, \quad \text{d) } \int \frac{x - (\arctan x)^5}{1+x^2} dx,$$

a) $\int \sin^4 x dx$ a), b) $\int \frac{\operatorname{arctg} \sqrt{x}}{\sqrt{x}} dx$; , c) $\int \frac{dx}{x^2(x-1)}$, d) $\int \frac{\ln x dx}{x(1-\ln^2 x)}$,

Card N 3

1. Calculate the following indefinite integrals in direct way

a) $\int \left(2\sqrt{x^3} + \frac{1}{4+x^2} \right) dx$, b) $\int \left(4\sin 7x + \frac{1}{1-x^2} \right) dx$, c) $\int \left(2\tan x - \frac{8}{1+x^2} \right) dx$, d) $\int \left((6x+7) + e^{3x} \right) dx$

e) $\int (3x^7 + 9\sin x) dx$, f) $\int \left(8\sqrt[4]{x} - \frac{3}{\sqrt{1-x^2}} \right) dx$, g) $\int (5x^6 + \cos x) dx$, h) $\int \left(\frac{1}{x^3} + \frac{5}{\sqrt{x^2-1}} \right) dx$

i) $\int (5e^x + 1) dx$, l) $\int \left(3\sin x + \frac{1}{4-x^2} \right) dx$ m) $\int \left(4\cot x - \frac{7^x}{3^2} \right) dx$, n) $\int \left((5x+1) + e^{5x} \right) dx$

2. Calculate the following integrals applying the different approaches

a) $\int \frac{1 + (\arcsin x)^3}{\sqrt{1-x^2}} dx$, b) $\int \sin^3 x dx$, c) $\int \frac{x^5 dx}{\sqrt{9-x^6}}$, d) $\int \frac{\sqrt{\ln x}}{x} dx$;

e) $\int \cos^4 x dx$, f) $\int \frac{\arcsin \sqrt{x}}{\sqrt{x}} dx$, g) $\int \frac{dx}{x(x-2)^2}$, h) $\int \sqrt{e^x - 1} dx$,

Card N 4

1. Calculate the following indefinite integrals in direct way

a) $\int \left(7\sqrt{x^7} + \frac{1}{2+x^2} \right) dx$, b) $\int \left(2\sin 4x + \frac{1}{4-x^2} \right) dx$, c) $\int \left(2\cot x - \frac{6}{1+x^2} \right) dx$, d) $\int \left((6x+7) + e^{3x} \right) dx$

e) $\int (2x^9 + 3\sin x) dx$, f) $\int \left(8\sqrt[4]{x} - \frac{3}{\sqrt{1-x^2}} \right) dx$, g) $\int (5x^3 + \cos x) dx$, h) $\int \left(\frac{1}{x^5} + \frac{5}{\sqrt{x^2-1}} \right) dx$

i) $\int \left(5\sqrt{x^5} + \frac{1}{144+x^2} \right) dx$, l) $\int \left(3\sin 3x + \frac{1}{4-x^2} \right) dx$ m) $\int \left(4\cot x - \frac{7}{1+x^2} \right) dx$, n) $\int \left((5x+1) + e^{5x} \right) dx$

2. Calculate the following integrals applying the different approaches

$$a) \int \frac{1 + (\arcsin x)^3}{\sqrt{1-x^2}} dx, \quad b) \int \sin^3 x dx, \quad c) \int \frac{x^5 dx}{\sqrt{9-x^6}}, \quad d) \int \frac{\sqrt{\ln x}}{x} dx;$$

$$e) \int \cos^4 x dx, \quad f) \int \frac{\arcsin \sqrt{x}}{\sqrt{x}} dx, \quad g) \int \frac{dx}{x(x-2)^2}, \quad h) \int \sqrt{e^{2x}-1} dx,$$

Card N 5

1. Calculate the following indefinite integrals in direct way

$$a) \int \left(3\sqrt{x^3} + \frac{1}{8+x^2} \right) dx, \quad b) \int \left(2\sin x + \frac{1}{125-x^2} \right) dx, \quad c) \int \left(2^x - \frac{3}{1+x^2} \right) dx, \quad d) \int ((7x+7)+e^x) dx$$

$$e) \int (2x^9 + 3\sin x) dx, \quad f) \int \left(8\sqrt{x} - \frac{3}{\sqrt{1-x^2}} \right) dx, \quad g) \int (5x^3 + \cos x) dx, \quad h) \int \left(\frac{1}{x^5} + \frac{5}{\sqrt{x^2-1}} \right) dx$$

$$i) \int \left(5\sqrt{x^5} + \frac{1}{144+x^2} \right) dx, \quad l) \int \left(3\sin 3x + \frac{1}{4-x^2} \right) dx \quad m) \int \left(4\cot x - \frac{7}{1+x^2} \right) dx, \quad n) \int ((5x+1)+e^{5x}) dx$$

2. Calculate the following integrals applying the different approaches

$$a) \int \frac{x - \sqrt{(\arctan x)^3}}{1+x^2} dx, \quad b) \int \cos^3 x dx, \quad c) \int \frac{x^5 dx}{\sqrt{8-2x^6}}, \quad d) \int \frac{\cos \sqrt{x}}{\sqrt{x}} dx,$$

$$e) \int \sqrt{9-x^2} dx, \quad f) \int \frac{1}{2\cos^2 x + 3\cos x \sin x + \sin^2 x} dx, \quad g) \int \frac{\ln \ln x}{x} dx \quad h) \int \frac{x}{(2+x)(x-4)} dx$$

Card N 4

1. Calculate the following indefinite integrals in direct way

$$a) \int \left(7\sqrt{x^7} + \frac{1}{2+x^2} \right) dx, \quad b) \int \left(2\sin 4x + \frac{1}{4-x^2} \right) dx, \quad c) \int \left(2\cot x - \frac{6}{1+x^2} \right) dx, \quad d) \int ((6x+7)+e^{3x}) dx$$

$$e) \int (2x^9 + 3\sin x) dx, \quad f) \int \left(8\sqrt{x} - \frac{3}{\sqrt{1-x^2}} \right) dx, \quad g) \int (5x^3 + \cos x) dx, \quad h) \int \left(\frac{1}{x^5} + \frac{5}{\sqrt{x^2-1}} \right) dx$$

$$i) \int \left(5\sqrt{x^5} + \frac{1}{144+x^2} \right) dx, \quad l) \int \left(3\sin 3x + \frac{1}{4-x^2} \right) dx \quad m) \int \left(4\cot x - \frac{7}{1+x^2} \right) dx, \quad n) \int ((5x+1)+e^{5x}) dx$$

2. Calculate the following integrals applying the different approaches

a) $\int \frac{1 + (\arcsin x)^3}{\sqrt{1-x^2}} dx$, b) $\int \sin^3 x dx$, c) $\int \frac{x^5 dx}{\sqrt{9-x^6}}$, d) $\int \frac{\sqrt{\ln x}}{x} dx$;

e) $\int \cos^4 x dx$, f) $\int \frac{\arcsin \sqrt{x}}{\sqrt{x}} dx$, g) $\int \frac{dx}{x(x-2)^2}$, h) $\int \sqrt{e^{2x}-1} dx$,

1.1.	$\int \frac{\sqrt{x} - x^3 e^x + x^2}{x^3} dx$
1.2.	$\int \left(\frac{1-z}{z} \right)^2 dz$
1.3.	$\int \frac{(1+\sqrt{x})^3}{\sqrt[3]{x}} dx$
1.4.	$\int \frac{dx}{\sqrt{3-3x^2}}$
1.5.	$\int \frac{1+\cos^2 x}{1+\cos 2x} dx$
1.6.	$\int \frac{(1+x)^2}{x(1+x^2)} dx$
1.7.	$\int \sqrt{8-2x} dx$
1.8.	$\int 2x\sqrt{x^2+1} dx$
1.9.	$\int x^2 \sqrt[5]{x^3+2} dx$
1.10.	$\int \frac{x^4}{\sqrt{1+x^5}} dx$
1.11.	$\int \frac{(6x-5)dx}{2\sqrt{3x^2-5x+6}}$
1.12.	$\int \frac{\sin x}{\cos^2 x} dx$
1.13.	$\int \cos^3 x \sin 2x dx$
1.14.	$\int \frac{(\arctan x)^2}{1+x^2} dx$
1.15.	$\int \frac{d(1+\ln x)}{\cos^2 x(1+\ln x)} dx$

1.16. $\int \frac{xdx}{x^2 + 1}$
1.17. $\int \frac{e^x dx}{e^x + 1}$
1.18. $\int \frac{\sin 2x}{1 + \cos^2 x} dx$
1.19. $\int \frac{dx}{1 + 9x^2}$
1.20. $\int \frac{x^2 dx}{x^6 + 4}$
1.21. $\int \frac{e^x dx}{e^{2x} + 4}$
1.22. $\int \frac{3x - 1}{x^2 + 9} dx$
1.23. $\int \frac{x(1 - x^2)}{1 + x^4} dx$
1.24. $\int \frac{dx}{\left(x + \sqrt{x^2 - 1}\right)^2}$
1.25. $\int \frac{1 + (\arccos 3x)^2}{\sqrt{1 - 9x^2}} dx$

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Homework
1.26. $\int (\sqrt{x} + 1)(x - \sqrt{x} + 1) dx$
1.27. $\int \frac{(1 - x)^2}{x\sqrt{x}} dx$
1.28. $\int \frac{3 \cdot 2^x - 2 \cdot 3^x}{2^x} dx$
1.29. $\int \frac{\cos 2x}{\cos^2 x \cdot \sin^2 x} dx$
1.30. $\int \frac{(1 + 2x^2)}{x^2(1 + x^2)} dx$
1.31. $\int \frac{dx}{\cos 2x + \sin^2 x}$

1.32. $\int \frac{dx}{(2x-3)^3}$
1.33. $\sqrt[5]{\int (8-3x)^6 dx}$
1.34. $\int x\sqrt{1-x^2} dx$
1.35. $\int \frac{xdx}{\sqrt{x^2+1}}$
1.36. $\int \frac{x^3 dx}{\sqrt[3]{x^4+1}}$
1.37. $\int \frac{\cos x dx}{\sqrt[3]{\sin^2 x}}$
1.38. $\int \frac{\sqrt{\ln x}}{x} dx$
1.39. $\int \frac{dx}{(\arcsin x)^3 \sqrt{1-x^2}}$
1.40. $\int \sin(2x-3) dx$
1.41. $\int \left[\cos\left(2x - \frac{\pi}{4}\right) \right]^{-2} dx$
1.42. $\int \frac{x^2}{x^3+1} dx$
1.43. $\int e^{-3x+1} dx$
1.44. $\int \frac{dx}{\sqrt{1-25x^2}}$
1.45. $\int \frac{dx}{\sqrt{4-9x^2}}$
1.46. $\int \frac{x^3 dx}{\sqrt{1-x^8}}$
1.47. $\int \frac{2^x dx}{\sqrt{1-4^x}}$

$$1.48. \int \frac{e^{2x} - 1}{e^x} dx$$

$$1.49. \int \frac{1 + x}{\sqrt{1 - x^2}} dx$$

$$1.50. \int \sqrt{\frac{1 - x}{1 + x}} dx$$

$$1.51. \int \frac{1 + x - x^2}{\sqrt{(1 - x^2)^3}} dx$$

$$1.52. \int \frac{2x - \sqrt{\arcsin x}}{\sqrt{(1 - x^2)}} dx$$