Oefeningen Integralen

0.1 Niveau 1

Oefening 1. Bereken volgende onbepaalde integralen:

1. $\int x^{-2}\,dx = \ldots\ldots$
2. $\int e^{x}\,dx = \ldots\ldots$
3. $\int 8^{x}\,dx = \ldots\ldots$
4. $\int \frac{3}{1+x^2}\,dx = \ldots\ldots$
5. $\int \frac{1}{2\cos^2 x}\,dx = \ldots\ldots$
6. $\int 2^8 x\,dx = \ldots\ldots$
7. $\int \left(3x^2+2x+1\right)\,dx = \ldots\ldots$
8. $\int 2y\,dy = \ldots\ldots$
9. $\int \cos y\,dy = \ldots\ldots$
10. $\int \sin t\,dt = \ldots\ldots$

Oefening 2. Bereken volgende onbepaalde integralen via een geschikte substitutie:

1. $\int e^{2x}\,dx = \ldots\ldots$
2. $\int 2^{3x}\,dx = \ldots\ldots$
3. $\int \frac{4}{2x-3}\,dx = \ldots\ldots$

Oefening 3. Bereken volgende onbepaalde integralen via een geschikte substitutie:

1. $\int \frac{1}{x-3}\,dx = \ldots\ldots$
2. $\int \frac{1}{3-x}\,dx = \ldots\ldots$
3. $\int \frac{x}{3-x}\,dx = \ldots\ldots$

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0.2 Niveau 2

Oefening 4. Bereken volgende onbepaalde integralen:

1. $\int ax\ dx = \ldots\ldots$
2. $\int tx\ dx = \ldots\ldots$
3. $\int tx\ dt = \ldots\ldots$

Oefening 5. Bereken volgende onbepaalde integralen:

1. $\int x^3 \cdot \sqrt{x}\ dx = \ldots\ldots$
2. $\int \frac{2x^4 + x^3 + 3x^2 + 21}{x^3}\ dx = \ldots\ldots$

Oefening 6. Bereken volgende onbepaalde integralen via een geschikte substitutie:

1. $\int 2x\cos(x^2)\ dx = \ldots\ldots$
2. $\int (3x+5)\sqrt{3x+4}\ dx = \ldots\ldots$
3. $\int 4x\sqrt{x-1}\ dx = \ldots\ldots$
4. $\int \cos x \sin^2 x\ dx = \ldots\ldots$
5. $\int \cos 2x \sin^3 2x\ dx = \ldots\ldots$
6. $\int \frac{3\tan 2x}{5\cos^2 2x}\ dx = \ldots\ldots$
7. $\int \frac{\sin x \cos x}{2 - \cos x}\ dx = \ldots\ldots$
8. $\int \frac{1}{2x^2+1}\ dx = \ldots\ldots$
9. $\int \frac{1}{x^2+2}\ dx = \ldots\ldots$
10. $\int \frac{2x}{x^2+4}\ dx = \ldots\ldots$
11. $\int \frac{3t}{1+t^2}\ dt = \ldots\ldots$
12. $\int \frac{x}{x^2+4}\ dx = \ldots\ldots$
13. $\int \frac{2x}{\sqrt{x^2+4}}\ dx = \ldots\ldots$

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14. $\displaystyle\int \frac{2x}{\sqrt{x^2+R^2}}\,dx = \ldots\ldots$

15. $\displaystyle\int \frac{2R}{\sqrt{x^2+R^2}}\,dR = \ldots\ldots$

16. $\displaystyle\int \frac{R^3}{\sqrt{x^2+R^2}}\,dR = \ldots\ldots$

Oefening 7. Bereken volgende onbepaalde integralen via partiële integratie:

1. $\displaystyle\int xe^{-3x}\,dx = \ldots\ldots$

2. $\displaystyle\int \left(3x+x^2\right)e^{x}\,dx = \ldots\ldots$

3. $\displaystyle\int \operatorname{bgtan} x\,dx = \ldots\ldots$

4. $\displaystyle\int \operatorname{bgsin}\theta\,d\theta = \ldots\ldots$

5. $\displaystyle\int \ln\sqrt{x}\,dx = \ldots\ldots$

6. $\displaystyle\int e^{x}\cos 3x\,dx = \ldots\ldots$

7. $\displaystyle\int \frac{\ln t}{t^2}\,dt = \ldots\ldots$

Oefening 8. Bereken volgende bepaalde integralen:

1. $\displaystyle\int_0^{\frac{\pi}{2}} x\sin x\,dx = \ldots\ldots$

2. $\displaystyle\int_0^{\frac{\pi}{2}} \sin^2\theta\cos\theta\,d\theta = \ldots\ldots$

3. $\displaystyle\int_0^{\frac{\pi}{3}} \cos 2x\sin x\,dx = \ldots\ldots$

4. $\displaystyle\int_0^{1} xe^{2x}\,dx = \ldots\ldots$

5. $\displaystyle\int_0^{1} \frac{x}{(4+x^2)^2}\,dx = \ldots\ldots$

6. $\displaystyle\int_0^{2} \frac{2x+1}{\sqrt{x+1}}\,dx = \ldots\ldots$

7. $\displaystyle\int_0^{\pi} \cos^2 t\,dt = \ldots\ldots$

8. $\displaystyle\int_0^{\pi} x^2\cos 3x\,dx = \ldots\ldots$

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9. $\displaystyle\int_0^4 \frac{1}{1+\sqrt{x}}\,dx = \ldots\ldots$

10. $\displaystyle\int_0^1 x^3 e^{-x^2}\,dx = \ldots\ldots$

0.3 Niveau 3

Oefening 9. Bereken volgende onbepaalde integralen

1. $\displaystyle\int \frac{\cos^2 x}{1+\sin x}\,dx = \ldots\ldots$

2. $\displaystyle\int x^3 e^{x^2}\,dx = \ldots\ldots$

3. $\displaystyle\int \sin(\ln x)\,dx = \ldots\ldots$

Oefening 10. Bereken volgende onbepaalde integralen

1. $\displaystyle\int \frac{2x^2-3x+1}{2x^2+1}\,dx = \ldots\ldots$

2. $\displaystyle\int \frac{4}{x^2-4x+4}\,dx = \ldots\ldots$

3. $\displaystyle\int \frac{3t+1}{1+t^2}\,dt = \ldots\ldots$

4. $\displaystyle\int \frac{1}{x^2-4x+7}\,dx = \ldots\ldots$

5. $\displaystyle\int \frac{x^2+x+1}{x^2+1}\,dx = \ldots\ldots$

6. $\displaystyle\int \frac{3x+3}{x^2+2x+1}\,dx = \ldots\ldots$

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