Calculus I
Section 5.2 – Antiderivatives

Evaluate the following integrals. Check your answers by differentiating.

1. $\int 5-6x\, dx$

2. $\int \frac{t^2}{2}+4t^3\, dt$

3. $\int 1-x^2-3x^5\, dx$

4. $\int x^{-\frac{5}{4}}\, dx$

5. $\int \frac{\sqrt{x}}{2}+\frac{2}{\sqrt{x}}\, dx$

6. $\int \frac{1}{7}-\frac{1}{y^{\frac{5}{4}}}\, dy$

7. $\int x^{-3}(x+1)\, dx$

8. $\int \frac{4+\sqrt{t}}{t^3}\, dt$

9. $\int -5\sin t\, dt$

10. $\int -3\csc^2 x\, dx$

11. $\int -2\cos t\, dt$

12. $\int \frac{2}{5}\sec\theta\tan\theta\, d\theta$

13. $\int 2x(1-x^{-3})dx$

14. $\int x^{-\frac{1}{3}}\, dx$

15. $\int \frac{t\sqrt{t}+\sqrt{t}}{t^2}\, dt$

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Evaluate the following integrals. Check your answers by differentiating.

1. $\int 5 - 6x\,dx$

$5x - 3x^2 + C$

2. $\int \frac{t^2}{2} + 4t^3\,dt$

$\frac{1}{6}t^3 + t^4 + C$

3. $\int 1 - x^2 - 3x^5\,dx$

$x - \frac{1}{3}x^3 - \frac{1}{2}x^6 + C$

4. $\int x^{-5/4}\,dx$

$-4x^{-1/4} + C$

5. $\int \frac{\sqrt{x}}{2} + \frac{2}{\sqrt{x}}\,dx$

$\int \frac{1}{2}x^{1/2} + 2x^{-1/2}\,dx$

$\frac{1}{3}x^{3/2} + 4x^{1/2} + C$

6. $\int \frac{1}{7} - \frac{1}{y^{5/4}}\,dy$

$\frac{1}{7}y + 4y^{-1/4} + C$

7. $\int x^{-3}(x+1)\,dx$

$\int x^{-2} + x^{-3}\,dx$

$-x^{-1} - \frac{1}{2}x^{-2} + C$

8. $\int \frac{4+\sqrt{t}}{t^3}\,dt$

$\int 4t^{-3} + t^{-5/2}\,dt$

$-2t^{-2} - \frac{2}{3}t^{-3/2} + C$

9. $\int -5\sin t\,dt$

$5\cos t + C$

10. $\int -3\csc^2 x\,dx$

$3\cot x + C$

11. $\int -2\cos t\,dt$

$-2\sin t + C$

12. $\int \frac{2}{5}\sec\theta\tan\theta\,d\theta$

$\frac{2}{5}\sec\theta + C$

13. $\int 2x(1-x^{-3})\,dx$

$\int 2x - 2x^{-2}\,dx$

$x^2 + 2x^{-1} + C$

14. $\int x^{-1/3}\,dx$

$\frac{3}{2}x^{2/3} + C$

15. $\int \frac{t\sqrt{t} + \sqrt{t}}{t^2}\,dt$

$\int t^{-1/2} + t^{-3/2}\,dt$

$2t^{1/2} - 2t^{-1/2} + C$