Power/exponential/trigonometric antiderivatives

6 questions | 18 marks

Equivalent correct methods earn the corresponding marks.

1. Find $\int(8x^3 + e^x)\,dx$. [3 marks]

Apply the power and natural-exponential rules.

Answer: $2x^4 + e^x + C$

2. Find $\int\sqrt{x}\,dx$ for $x > 0$. [3 marks]

Rewrite as $x^{\frac{1}{2}}$, then divide $x^{\frac{3}{2}}$ by $\frac{3}{2}$.

Answer: $\frac{2}{3}x^{\frac{3}{2}} + C$

3. Find $\int x^{-2}\,dx$ on $x > 0$. [3 marks]

Raise the power to -1 and divide by -1.

Answer: $-x^{-1} + C$

4. Find $\int 4e^{-2x}\,dx$. [3 marks]

Divide coefficient 4 by -2.

Answer: $-2e^{-2x} + C$

5. Find $\int 3\sin(2x)\,dx$. [3 marks]

Use the negative-cosine antiderivative and divide by 2.

Answer: $-\frac{3}{2}\cos(2x) + C$

6. Find $\int(2\cos x - \sin x)\,dx$. [3 marks]

Integrate the two terms separately; check both signs.

Answer: $2\sin x + \cos x + C$