Definite integrals

6 questions | 18 marks

Equivalent correct methods earn the corresponding marks.

1. Evaluate $\int_0^3 2x\,dx$. [3 marks]

$[x^2]_0^3 = 9.$

Answer: 9

2. Evaluate $\int_1^2 3x^2\,dx$. [3 marks]

$[x^3]_1^2 = 8 - 1 = 7.$

Answer: 7

3. Evaluate $\int_2^0 (x+1)\,dx$. [3 marks]

$[\frac{x^2}{2} + x]_2^0 = 0 - 4 = -4.$

Answer: -4

4. Evaluate $\int_0^\pi \sin x\,dx$. [3 marks]

$[-\cos x]_0^\pi = 1 - (-1) = 2.$

Answer: 2

5. Evaluate $\int_1^e \frac{1}{x}\,dx$. [3 marks]

$[\ln x]_1^e = 1 - 0 = 1.$

Answer: 1

6. If $\int_0^2 f(x)\,dx = 5$ and $\int_2^5 f(x)\,dx = -1$, find $\int_0^5 3f(x)\,dx$. [3 marks]

Add the interval contributions: $5 + (-1) = 4.$

Multiply by 3 to obtain 12.

Answer: 12