

CALCULUS I – Worksheet #29

1. Suppose f and g are continuous functions and that:

$$\int_1^2 f(x) \, dx = -3 \quad \text{and} \quad \int_2^5 f(x) \, dx = 7 \quad \text{and} \quad \int_1^5 g(x) \, dx = 9 \quad \text{then find:}$$

a) $\int_1^5 f(x) \, dx$

b) $-4 \int_5^1 f(x) \, dx$

c) $\int_1^5 [4f(x) - 2g(x)] \, dx$

2. $\int x^2 \ln x \, dx$ (Integrate by Parts)

3. $\int x(\sin x) \, dx$ (Integrate by Parts)

4. $\int \frac{4}{x^2 + 1} \, dx =$ A) $2\ln(x^2 + 1) + C$ B) $\frac{-8}{(x^2 + 1)^2} + C$ C) $4 \sin^{-1} x + C$
D) $4 \operatorname{Arctan} x + C$ E) $\frac{4}{x \ln(x^2 + 1)} + C$

5. $\int \frac{5}{\sqrt{1-x^2}} \, dx =$ A) $5 \operatorname{Arctan} x + C$ B) $5 \sin^{-1} x + C$ C) $\frac{1}{5} \operatorname{Arcsin} x + C$
D) $\frac{5}{2} \sqrt{1-x^2} + C$ E) None of these
