

[12.2] - Double Integrals - Practice

1. $\int_0^2 \int_0^2 (x^2 - y^2) \, dy \, dx$

2. $\int_0^{\frac{\pi}{4}} \int_{y=0}^{\frac{\pi}{2}} \cos(2x + y) \, dy \, dx$

Hint: According to one of the [Trig addition formulas](#),

$$\cos(\alpha + \beta) = \cos(\alpha) \cos(\beta) - \sin(\alpha) \sin(\beta)$$

3. $\int_0^2 \int_{y=1}^3 x^3 y \, dy \, dx$

4. $\int_{-1}^1 \int_{y=0}^{\pi} x^2 \sin y \, dy \, dx$

5. $\int_0^2 \int_{y=x^2}^{2x} (x^2 + 2y) \, dy \, dx$

6. $\int_0^3 \int_{y=0}^{9-x^2} 4x \, dy \, dx$

Answers: 1.) 0 2.) 0 3.) 16 4.) $\frac{4}{3}$ 5.) $\frac{88}{15}$ 6.) 81