

Chapter 16A(16.2-16.4) Practice Test

Calculate the iterated integral.

$$\int_0^1 \int_1^4 \frac{4xe^x}{y} dy dx =$$

$$\int_0^1 \int_0^1 15(u - v)^5 du dv =$$

$$\int_0^4 \int_0^\pi 2r(\sin(\theta))^2 d\theta dr =$$

$$\int_0^1 \int_0^1 5xy\sqrt{x^2 + y^2} dy dx =$$

Calculate the double integral.

$$\iint_R (6x^2y^3 - 5y^4) dA, R = \{(x, y) | 0 \leq x \leq 1, 0 \leq y \leq 1\}$$

$$\iint_R 3 \cos(x + 2y) dA, R = \{(x, y) | 0 \leq x \leq \pi, 0 \leq y \leq \frac{\pi}{2}\}$$

$$\iint_R \frac{xy^2}{x^2 + 1} dA, R = \{(x, y) | 0 \leq x \leq 1, -1 \leq y \leq 1\}$$

$$\iint_R \frac{5(1 + x^2)}{1 + y^2} dA, R = \{(x, y) | 0 \leq x \leq 1, 0 \leq y \leq 1\}$$

$$\iint_R x \sin(x + y) dA, R = \left[0, \frac{\pi}{6}\right] \times \left[0, \frac{\pi}{3}\right]$$

$$\iint_R \frac{7x}{1 + xy} dA, R = [0, 7] \times [0, 1]$$

Find the volume of the solid that lies under the plane $3x + 2y + z = 12$ and above the rectangle.

$$R = \{(x, y) | 0 \leq x \leq 1, -4 \leq y \leq 2\}$$

Find the volume of the solid that lies under the hyperbolic paraboloid $z = 2 + x^2 - y^2$ and above the rectangle.

$$R = [-4, 4] \times [0, 1]$$

Find the volume of the solid in the first octant bounded by the parabolic cylinder $z = 36 - x^2$ and the plane $y = 1$.

Find the volume of the solid enclosed by the paraboloid $z = 5 + x^2 + (y - 2)^2$ and the planes $z = 1$, $x = -1$, $x = 1$, $y = 0$, and $y = 1$.

Evaluate the double integral.

$$\iint_D \frac{8y}{2x^5 + 1} dA, D = \{(x, y) | 0 \leq x \leq 1, 0 \leq y \leq x^2\}$$

$$\iint_D 7y^2 e^{xy} dA, D = \{(x, y) | 0 \leq y \leq 7, 0 \leq x \leq y\}$$

$$\iint_D 7x \cos y dA, D \text{ is bounded by } y = 0, y = x^2, x = 7$$

$$\iint_D (7x + 7y) dA, D \text{ is bounded by } y = \sqrt{x} \text{ and } y = x^2$$

$$\iint_D 2xy^2 dA, D \text{ is enclosed by } x = 0 \text{ and } x = \sqrt{1 - y^2}$$

$\iint 2xy dA$, D is the triangular region with vertices $0,0$, $1,2$, and $0,3$.

$\iint 7x - 7y dA$, D is bounded by the circle with center the origin and radius 1.

Find the volume of the solid under the plane $7x + 7y - z = 0$ and above the region bounded by $y = x$ and $y = x^4$.

Find the volume of the solid enclosed by the paraboloid $z = x^2 + 3y^2$ and the planes $x = 0$, $y = 5$, $y = x$, $z = 0$.

Find the volume of the solid under the surface $z = x + 4y^2$ and above the region bounded by $x = y^2$ and $x = y^3$.

Find the volume of the solid bounded by the planes $z = x$, $y = x$, $x + y = 4$ and $z = 0$.

Find the volume of the solid bounded by the cylinders $z = 4x^2$, $y = x^2$ and the planes $z = 0$, $y = 1$.

Find the volume of the solid bounded by the cylinder $y^2 + z^2 = 4$ and the planes $x = 2y$, $x = 0$, $z = 0$ in the first octant.

Sketch the region of integration and change the order of integration. $\int_0^9 \int_0^{\sqrt{x}} f(x, y) dy dx$

Evaluate the integral by reversing the order of integration.

$$\int_0^2 \int_{3y}^6 6e^{x^2} dx dy \quad \int_0^{\sqrt{3\pi}} \int_y^{\sqrt{3\pi}} \cos(6x^2) dx dy \quad \int_0^4 \int_{\sqrt{x}}^2 \frac{6}{y^3 + 1} dy dx$$

$$\int_0^2 \int_x^2 6e^{\frac{x}{y}} dy dx \quad \int_0^1 \int_{\arcsin(y)}^{\frac{\pi}{2}} \cos(x) \sqrt{5 + (\cos(x))^2} dx dy$$

Sketch the region whose area is given by the integral and evaluate the integral.

$$\int_{\pi}^{2\pi} \int_4^5 4r dr d\theta =$$

$$\int_0^{\pi/2} \int_0^{14 \cos \theta} r dr d\theta =$$

Evaluate the given integral by changing to polar coordinates. $\iint_R (x + y) dA$,

where R is the region that lies to the left of the y -axis between the circles $x^2 + y^2 = 1$ and $x^2 + y^2 = 16$.

Evaluate the given integral by changing to polar coordinates. $\iint_R \sqrt{81 - x^2 - y^2} dA$,

where $R = \{(x, y) | x^2 + y^2 \leq 81, x \geq 0\}$.

Evaluate the given integral by changing to polar coordinates. $\iint_D x dA$,

where D is the region in the first quadrant that lies between the circles $x^2 + y^2 = 100$ and $x^2 + y^2 = 10x$.

Use a double integral to find the area of the region. One loop of the rose $r = 9\cos(3\theta)$.