

15.6 Triple Integrals

◎ 單選擇題

1. Let

$$I = \iiint_D f(x, y, z) dV,$$

where D is the solid bounded by $y = x^2$, $z = y$ and $y = 4$. Then, for any continuous function f , I always equals

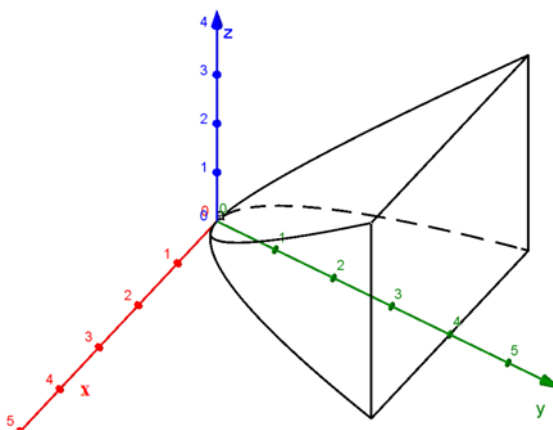
(A) $\int_{-2}^2 \int_0^4 \int_{x^2}^4 f(x, y, z) dy dz dx;$

(B) $\int_{-2}^2 \int_0^4 \int_z^4 f(x, y, z) dy dz dx;$

(C) $\int_{-2}^2 \int_0^{x^2} \int_{x^2}^4 f(x, y, z) dy dz dx + \int_{-2}^2 \int_{x^2}^4 \int_z^4 f(x, y, z) dy dz dx;$

(D) $\int_{-2}^2 \int_0^{x^2} \int_z^4 f(x, y, z) dy dz dx + \int_{-2}^2 \int_{x^2}^4 \int_{x^2}^4 f(x, y, z) dy dz dx.$

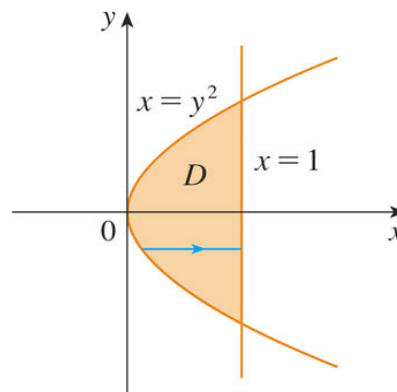
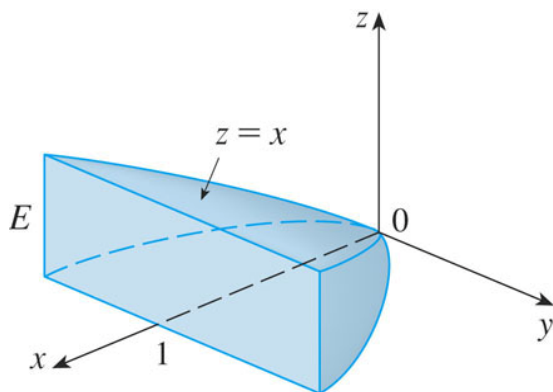
Ans: C [105 學年度]



2. Let E be the following solid bounded by $x = y^2$, $x = 1$, $z = 0$ and $z = x$. If

$$\iiint_E f(x, y, z) dV = \int_{-1}^1 \int_0^1 \int_{\square} f(x, y, z) dx dz dy,$$

then $\square =$



Ans: D [100 學年度]

◎ 多選擇題

1. Which of the following iterate integrals are equal to the iterate integral

$$\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^x f(x, y, z) \, dz dy dx$$

(A) $\int_0^1 \int_0^z \int_0^{\sqrt{1-x^2}} f(x, y, z) \, dy dz dx,$

(B) $\int_0^1 \int_0^x \int_0^{\sqrt{1-x^2}} f(x, y, z) \, dy dz dx,$

(C) $\int_0^1 \int_0^{\sqrt{1-z^2}} \int_z^{\sqrt{1-z^2}} f(x, y, z) \, dx dy dz,$

(D) $\int_0^1 \int_0^{\sqrt{1-z^2}} \int_z^{\sqrt{1-y^2}} f(x, y, z) \, dx dy dz.$

Ans: BD [99 學年度]

2. Which of the following iterated integrals are equal to the iterated integral

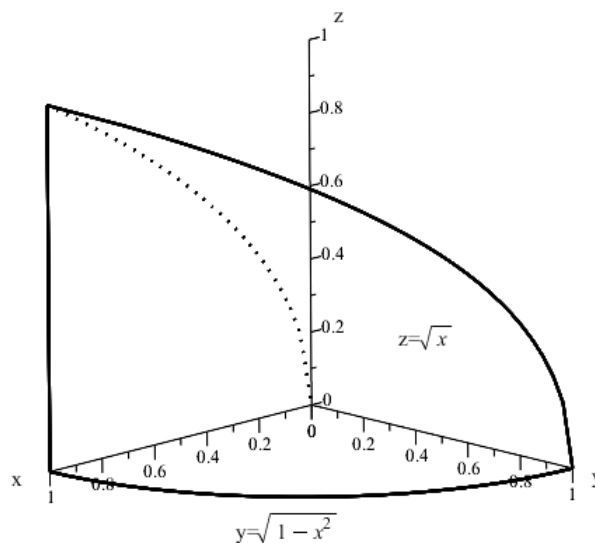
$$\int_0^1 \int_0^{\sqrt{1-x^2}} \int_0^{\sqrt{x}} f(x, y, z) \, dz dy dx;$$

(A) $\int_0^1 \int_0^{x^2} \int_0^{1-\sqrt{z}} f(x, y, z) \, dy dz dx;$

(B) $\int_0^1 \int_0^{\sqrt{x}} \int_0^{\sqrt{1-x^2}} f(x, y, z) \, dy dz dx;$

(C) $\int_0^1 \int_0^{\sqrt{1-z^4}} \int_{z^2}^{\sqrt{1-y^2}} f(x, y, z) \, dx dy dz;$

(D) $\int_0^1 \int_0^{\sqrt{1-z^2}} \int_{z^2}^{\sqrt{1-z^2}} f(x, y, z) \, dx dy dz$



Ans: BC [101 學年度]

◎ 填空題

1. The **volume** of the solid $\{(x, y, z) \mid |x| + |2y| + |3z| \leq 1\}$ is _____.

Ans: $\frac{2}{9}$ [102 學年度]