Area and volume by double integral

Area of the region D by double integral :

The area of the region D in the xy-plane is given by $A = \iint_D dx\,dy = \iint_D dA$.

Q.1. The area of the planer region bounded by the curve $x = 6y^2 - 2$ and $x = 2y^2$. **IIT-JAM 2015**

(a) $\frac{\sqrt{2}}{3}$ (b) $\frac{2\sqrt{2}}{3}$

(c) $\frac{4\sqrt{2}}{3}$ (d) $\sqrt{2}$

Q.2. The area of $\{ (x,y) \in R^2 ; |x| + |y| \leq 2\}$ is **HCU 2021**

(a) 4 (b) 8 (c) 10

(d) 5

Q.3. The area of the region in the first quadrant that is bounded by $y = \sqrt{x}$, $y = x - 2$ and the x-axis

(a) 1/3 (b) 10

(c) 10/3 (d) 4

Q4. Area enclosed by the curve $y^2 = x$ and $y^2 = 2x - 1$ lying in the first quadrant is **IIT JAM – 2005**

(a) 1/6 (b) 1/4

(c) 1/2 (d) 1/3

Q.5. Consider the open rectangle $G = \{(s,t) \in R^2 : 0 < s < 1$ and $0 < t < 1\}$ and the map $T : G \to R^2$ given by $T(s,t) = \left(\frac{\pi s(1-t)}{2}, \frac{\pi(1-s)}{2} \right)$ for $(s,t) \in G$ Then the area of the image T(G) of the map T is equal to **IIT JAM 2022**

(a) $\pi/4$ (b) $\pi^2/4$

(c) $\pi^2/8$ (d) 1