SAMPLE 1

1. Evaluate the integral $\int x\, e^x\, dx$.

2. Sketch the region bounded by the graph of $y = x^2$ and $y = x$, then find its area.

3. Let R be a region bounded by the graphs of the functions $y = \sqrt{x}$ and $y = x$ over the interval $[0, 1]$. Evaluate the volume of the solid generated by revolving R about x-axis.

SAMPLE 2

1. Evaluate the integral $\int x \cos x \, dx$.

2. Sketch the region bounded by the graph of $y = x^2$ and $x = y^2$, then find its area.

3. Let R be a region bounded by the graphs of the functions $y = 2\sqrt{x}$ and $y = x$ over the interval $[0, 4]$. Evaluate the volume of the solid generated by revolving R about x-axis.

SAMPLE 3

1. Evaluate the integral $\int x \sin x \, dx$.

2. Sketch the region bounded by the graph of $y = \frac{1}{2}x^2$ and $x = 4y^2$, then find its area.

3. Let R be a region bounded by the graphs of the functions $y = 2x^2$ and $y = 4x$ over the interval $[0, 2]$. Evaluate the volume of the solid generated by revolving R about x-axis.

SAMPLE 4

1. Evaluate the integral $\int x \sec^2 x \, dx$.

2. Sketch the region bounded by the graph of $y = x^2$ and $y = \sqrt{x}$, then find its area.

3. Let R be a region bounded by the graphs of the functions $y = 3x^2$ and $y = 3x$ over the interval $[0, 1]$. Evaluate the volume of the solid generated by revolving R about x-axis.