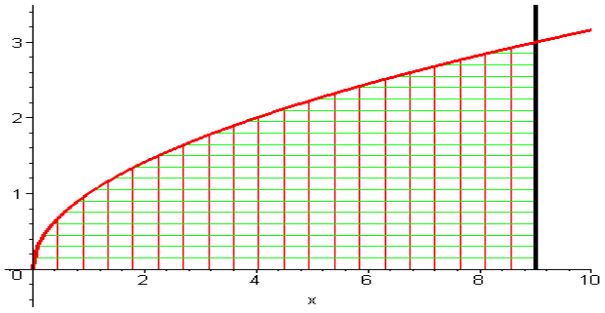
Solution Math 201 Quiz 5 (A)

Q.1: Evaluate the integral $\int_0^3 \int_{y^2}^9 y\cos\left(x^2\right) dxdy$.

Sol: We need to change the order of integration



$$\int_0^9 \int_0^{\sqrt{x}} y\cos\left(x^2\right) dydx = \frac{1}{4}\sin 81.$$

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

Sol: $\int_0^2 \int_0^{\sqrt{4-x^2}} 2ydydx = \frac{16}{3}$.

Q.3: Evaluate the integral $\iint_R \cos\left(x^2+y^2\right) dA$, where R is the region that lies above the $x-axis$ and within the circle $x^2+y^2=4$.

Sol: Using polar coordinates $\iint_R \cos\left(x^2+y^2\right) dA = \int_0^{\pi} \int_0^2 \cos\left(r^2\right) rdrd\theta = \frac{1}{2}\pi\sin 4$.