



Quiz # 11  
Math 102 Section 10 Calculus II  
20 April 2026, Monday  
Instructor: Ali Sinan Sertöz  
**Solution Key**

Bilkent University

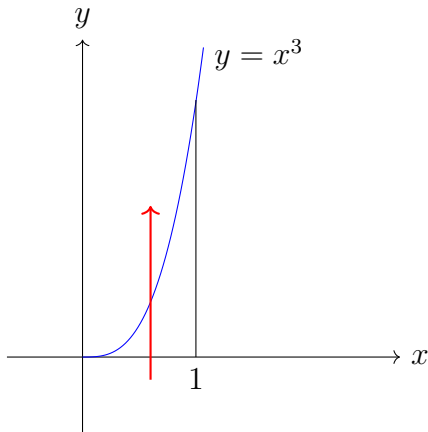
**Q-1)** Consider the double integral  $\int_0^1 \int_{y^{1/3}}^1 y^2 e^{x^{10}} dx dy$ .

- (a) Sketch the region of the integral.
- (b) Set up the integral for the reverse order of integration.
- (c) Evaluate the integral

Grading: 4+3+3=10 points.

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**Solution:**



$$\begin{aligned} \int_0^1 \int_{y^{1/3}}^1 y^2 e^{x^{10}} dx dy &= \int_0^1 \int_0^{x^3} y^2 e^{x^{10}} dy dx \\ &= \int_0^1 e^{x^{10}} \left( \frac{1}{3} y^3 \Big|_0^{x^3} \right) dx \\ &= \frac{1}{3} \int_0^1 e^{x^{10}} x^9 dx \\ &= \frac{1}{3} \left( \frac{1}{10} e^{x^{10}} \Big|_0^1 \right) \\ &= \frac{1}{30} (e - 1) \approx 0.06. \end{aligned}$$