



Quiz # 5  
Math 102-Section 06 Calculus II  
23 March 2017, Thursday  
Instructor: Ali Sinan Sertöz  
**Solution Key**



Bilkent University

Your Name: .....

Student ID: .....

Your Department: .....

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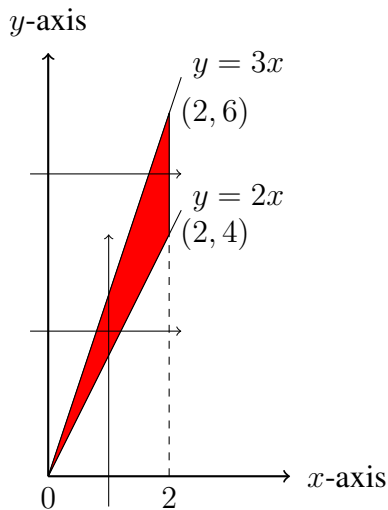
*Show your work in detail. Correct answers without justification are never graded.*

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**Q-1)** Evaluate  $A$ , where

$$A = \int_0^4 \int_{y/3}^{y/2} e^{x^2} dx dy + \int_4^6 \int_{y/3}^2 e^{x^2} dx dy.$$

**Answer:** We first plot the region.



The integrals of  $A$  are set up using the horizontal arrows above. To reverse the order of integration we follow the vertical arrow above.

$$\begin{aligned} A &= \int_0^2 \int_{2x}^{3x} e^{x^2} dy dx \\ &= \int_0^2 \left( y \Big|_{2x}^{3x} \right) e^{x^2} dx \\ &= \int_0^2 x e^{x^2} dx \\ &= \frac{1}{2} \left( e^{x^2} \Big|_0^2 \right) = \frac{1}{2} (e^4 - 1) \approx 27. \end{aligned}$$