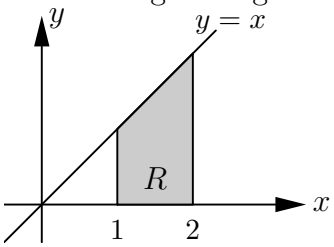
Date: June 24, 2009, Wednesday

Math 116 Calculus – QUIZ # 3

Q-1A) Question: Evaluate the following double integral

$$\int_R \int e^{x^2} dA$$

over the region R given below



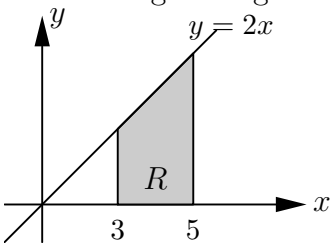
Solution:

$$\begin{aligned}
\int_R \int e^{x^2} dA &= \int_1^2 \int_0^x e^{x^2}\, dy\, dx \\
&= \int_1^2 e^{x^2} x\, dx \\
&= \frac{1}{2}\left(e^{x^2} \Big|_1^2 \right) \\
&= \frac{1}{2}\left(e^4 - e\right) \approx 26.
\end{aligned}$$

Q-1B) Question: Evaluate the following double integral

$$\int_R \int e^{x^2} dA$$

over the region R given below



Solution:

$$\begin{aligned}
\int_R \int e^{x^2} dA &= \int_3^5 \int_0^{2x} e^{x^2}\, dy\, dx \\
&= \int_3^5 2e^{x^2} x\, dx \\
&= \left(e^{x^2} \Big|_3^5 \right) \\
&= \left(e^{25} - e^9\right) \approx 7 \times 10^{10}.
\end{aligned}$$