



Class: 2<sup>st</sup>

Subject: Mathematics

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H.W

① Evaluate the integral:

a-  $\int_0^2 \int_{-1}^1 (x-y) dy dx$

b-  $\int_0^1 \int_1^2 xy e^x dy dx$

c-  $\int_0^{\ln 2} \int_1^{\ln 5} e^{2x+y} dy dx$

② Evaluate the double integral over the region R

a/  $\iint_R \frac{\sqrt{x}}{y^2} dA$       $R: 0 \leq x \leq 4 \ \& \ 1 \leq y \leq 2$

b/  $\iint_R xy \cos y \cdot dA$       $R: -1 \leq x \leq 1 \ \& \ 0 \leq y \leq \pi$

c/  $\iint_R \frac{xy^3}{x^2+1} dA$       $R: 0 \leq x < 1 \ \& \ 0 \leq y \leq 2$

③ Sketch the region of integration and write an equivalent double integral with the order of integration reversed

a/  $\int_0^1 \int_2^{4-2x} dy \cdot dx$

b/  $\int_0^1 \int_{1-x}^{1-x^2} dy \cdot dx$

c/  $\int_0^1 \int_y^{\sqrt{y}} dx \cdot dy$

④ Sketch the region bounded by the parabolas  $x=y^2$  and  $x=2y-y^2$ . Then express the region's area as an iterated double integral and evaluate the integral.

⑤ Evaluate  $\int_0^{\ln 2} \int_0^e dx \cdot dy$



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6) A thin plate cover the triangle region bounded by the x-axis and the line  $x=1$  and  $y=2x$  in the first quarter. The plate density is  $\delta(x,y) = 6x+6y+6$ . find

- The mass of the body.
- The center of mass.
- The radii of gyration.

7) Evaluate

a/  $\int_0^1 \int_0^{3-3x} \int_0^{3-3x-y} dz \cdot dy \cdot dx$

b/  $\int_0^3 \int_0^{\sqrt{9-x^2}} \int_0^{\sqrt{9-x^2}} dz \cdot dy \cdot dx$

c/  $\int_0^{\pi/6} \int_0^1 \int_{-2}^3 y \sin z \cdot dx \cdot dy \cdot dz$