MATH 2130 Tutorial 10

1. Evaluate the double iterated integral $\int_{-2}^{0}\int_{0}^{-x}\sqrt{y-x}\,dy\,dx$.

2. Evaluate the double integral of $f(x,y)=x^3y^4-3xy^2+y$ over the region bounded by the curves $y=-x^2$, $y=x^2-1$.

3. Evaluate the double iterated integral $\int_{-2}^{0}\int_{-3x}^{6}e^{y^2}\,dy\,dx$.

4. Evaluate the double integral

$$\iint_R \frac{1}{y-1}dy\,dx$$

where R is the region bounded by the curves $y=2x$, $y=x$, $x=2$, and $x=3$.

5. Find the volumes of the solids of revolution when the area bounded by the curves

$$y=2x-x^2,\quad y=x$$

is rotated around the lines: (a) $x=3$ (b) $y=1$ (c) $x+y=-1$.

Answers

1. $16(4-\sqrt{2})/15$

2. $-\sqrt{2}/3$

3. $(e^{36}-1)/6$

4. $(5/2)\ln 5-(3/2)\ln 3-2\ln 2$

5.(a) $5\pi/6$ (b) $2\pi/15$ (c) $7\sqrt{2}\pi/20$