ASSIGNMENT 4

Evaluate the following iterated integrals;

1. $\int_0^{2\pi}\int_0^{\frac{\pi}{4}}\int_0^1 \rho^2 \sin\phi d\rho d\phi d\theta$
2. $\int_0^{2\pi}\int_1^2\int_0^5 e^z r dz dr d\theta$
3. $\int_2^3\int_0^{3y}\int_1^{y^2}(2x+y+z)dxdydz$
4. $\int_0^{2\pi}\int_0^1 r\sin\theta dr d\theta$
5. $\int_0^1\int_0^1 e^{x+1}dydx$
6. Let R be the rectangular region in the xy plane bounded by the lines $x=2$, $x=\frac{5}{2}$, $y=0$ and $y=\pi$, and let D be the parallel-piped between the graphs $z=0$ and $z=2$ on R.
   Evaluate
   $$\iiint_D zx\sin xydv$$
7. Let R be the triangular region in the xy plane between the graphs of $y=0$ and $y=x$ for $0\le x\le 1$, and let D be the solid region between the graphs of the surfaces $z=-y^2$ and $z=x^2$ for (x,y) in R.
   Evaluate
   $$\iiint_D (x+1)dv.$$

Express the following double integral as an iterated integral and evaluate them;

8. $\iint_R (x+y)dA$; R is the rectangular region bounded by the lines $x=2$, $x=3$, $y=4$, $y=6$.
9. $\iint_R xdA$; R is the trapezoidal region bounded by the lines $x=3$, $x=5$, $y=1$ and $y=x$.
10. Let R be the region between the polar graphs of $r=\theta$ and $r=2\theta$ for $0\le\theta\le 3\pi$.
    Evaluate $\iint_R (x^2+y^2)dA$.