

- The questions are designed to help you with material covered in Week 9. You will get help with them in the tutorial on 14 or 15 March.
 - You should write up your solution to the starred question (*) clearly and hand it in to your personal tutor in your assigned tutorial on 21 or 22 March for feedback. *Remember to put your full name and student number on the top of your solution. Your marked solution to the feedback question will be returned to you via the Maths School Office after 27 March.*
 - It is important that you try to do all of the questions.
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1: Sketch the region of integration and integrate:

(a) the function $f(x, y) = x/y$ over the region bounded by the lines $y = x$, $y = 2x$, $x = 1$, $x = 2$;

(b) the function $f(x, y) = x^2 + y^2$ over the triangular region with vertices $(0,0)$, $(1,0)$ and $(0,1)$.

(*) 2: Sketch the region of integration of the double integral

$$\int_0^1 \int_{\sqrt{y}}^1 y \sin x^5 dx dy.$$

By reversing the order of the integration, evaluate the integral. [2008 exam question]

3: Sketch the region of integration, indicating the coordinates of the points where the boundary curves intersect, and then find the area

$$\int_0^6 \int_{y^2/3}^{2y} dx dy.$$

4: Find the average height of the paraboloid $z = x^2 + y^2$ over the square $0 \leq x \leq 2$, $0 \leq y \leq 2$.