

Homework 6, due Friday 2/24

1. p. 243, problem 2,3
2. Find the absolute maximum and minimum of $f(x, y) = 3x + 2y$ in the disk $\{(x, y) | x^2 + y^2 \leq 4\}$ of radius 2.
3. p. 244, problem 13. Hint: write functions f (for the amount of metal) and g (for the volume) in terms of radius r and height h .
4. Find the point on the line $y = x + 2$ which is closest to the origin. Hint: Set $f(x, y) = x^2 + y^2 = \|(x, y)\|^2$ and $g(x, y) = x + 2 - y$. Explain why it is enough to find the minimum of $f(x, y)$ on the level set $g(x, y) = 0$.
5. Let $f(x, y) = -3$ and $R = [2, 5] \times [-2, 3]$.
 - (a) Sketch R and the graph of f .
 - (b) Find $\int \int_R f(x, y) dA$ using the geometric interpretation ('signed volume').
 - (c) Find $\int \int_R f(x, y) dA$ using Fubini's theorem.
6. p. 325, problems (1) (a) and (c)
7. p. 327, problems (7), (9)
8. p. 340, problems (3), (6)
9. p. 347, problems (1) (a), (c) (note that in 1 (a) you should read $\int \int 1 dy dx$).
10. p. 347, problem 2 (f)
11. p. 348, problems (5), (6), (7), (9)