

MAT 21 D - Problem Set 8
Due beginning of discussion session on June
8th

Problem numbers are from Thomas' Calculus, 13th edition. If unsure about which problem to solve, ask. Collaboration is permitted but every student must write his or her own solution; looking for solutions from external sources (books, the web, material from previous years, etc.) is prohibited.

1 Solve and turn in the following problems:

1. Apply Green's theorem to evaluate the following integral:

$$\oint_C (6y + x) dx + (y + 2x) dy$$

C : the circle $(x - 2)^2 + (y - 3)^2 = 4$.

2. Use a parametrization to find the flux $\iint_S \mathbf{F} \cdot \mathbf{n} d\sigma$ of field $\mathbf{F} = 4x\mathbf{i} + 4y\mathbf{j} + 2\mathbf{k}$ outward (normal away from the z -axis) through the surface cut from the bottom of the paraboloid $z = x^2 + y^2$ by the plane $z = 1$. (Note: S is only part of the paraboloid; the plane is not part of S , it is only used to specify the cut)

2 Solve but do not turn in the following problems:

Section 16.4: 3, 5, 15, 19, 23, 27, 33

Section 16.5: 1, 3, 15, 17, 25, 27, 31

Section 16.6: 1, 15, 19, 27, 43