

MEMORIAL UNIVERSITY OF NEWFOUNDLAND

DEPARTMENT OF MATHEMATICS AND STATISTICS

ASSIGNMENT 6

Math 3202

SPRING 2019

Due: Friday, July 12th, 2019 at 1:00pm. SHOW ALL WORK.

Note: The following textbook problems are useful practice for the topics covered on this assignment:

- Section 15.5, #s 1–12
- Section 16.6, #s 39–50
- Section 16.7, #s 5–20

- Find the surface area of each of the following surfaces S .
 - S is the portion of the surface $2x^2 + 8y - z + 3 = 0$ which lies above the triangle in the xy -plane with vertices $(0, 0)$, $(1, 0)$ and $(1, 8)$
 - S is the portion of the elliptic paraboloid $z = x^2 + y^2$ that lies inside the cylinder $x^2 + y^2 = 2$
 - S is the portion of the helicoid parametrised by $\mathbf{R}(u, v) = \langle u \cos(v), u \sin(v), v \rangle$ for $0 \leq u \leq 1$ and $0 \leq v \leq \pi$
- Evaluate the surface integral $\iint_S yz \, dS$ over each of the following surfaces S .
 - S is the part of the plane $2x + 2y - z = 4$ which lies in the first octant
 - S is the portion of the helicoid described in #1(c)
- Consider the solid E in the first octant which lies between the planes $x + y + z = 1$ and $x + 2y + z = 1$.
 - Use a triple integral to find the volume of E .
 - Evaluate $\iiint_E (x + y) \, dV$.
- Let E be the solid which lies between the planes $z = 0$ and $z = y$ and inside the cylinder $x^2 + y^2 = 1$. Evaluate

$$\iiint_E (x + y)z \, dV$$

in Cartesian coordinates.