MTH 255
Surface Area Homework

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1. Let R be the rectangle $[0, 5] \times [1, 4]$. Let S be the part of the plane $z = 2 + 3x + 4y$ that lies above R. Find the area of S.

2. Let S be the part of the plane $3x + 2y + x = 6$ that lies in the first octant. Find the area of S.

3. Let S be the part of the cylinder $y^2 + z^2 = 9$ that lies above the rectangle with vertices $(0, 0), (4, 0), (0, 2)$, and $(4, 2)$. Find the area of S.

4. Let S be the part of the hyperbolic paraboloid $z = y^2 - x^2$ that lies between the cylinders $x^2 + y^2 = 1$ and $x^2 + y^2 = 4$. Find the area of S. Find the area of S.

5. Let S be the part of the surface $z = xy$ that lies within the cylinder $x^2 + y^2 = 1$. Find the area of S.

6. Let S be the part of the sphere $x^2 + y^2 + z^2 = 144$ that lies within the cylinder $x^2 + y^2 = 12x$ and above the xy-plane. Find the area of S.

7. Set up a double integral that represents the area of the part of the surface $z = e^{-x^2 - y^2}$ above the disk $x^2 + y^2 = 4$. Then transform this double integral into an iterated integral. *You do not need to evaluate this iterated integral.*