

Review for Math 252 Test 3

1. Use a triple integral to find the volume of the region in the first octant below the sphere $x^2 + y^2 + z^2 = 16$, and inside the cylinder $x^2 + y^2 = 4$.
2. Evaluate the line integral of $F(x, y, z) = (x, -y, z)$, where $c(t) = (\cos t, \sin t, t)$ from $t = 0$ to $t = 2\pi$.
3. Give two other iterated integrals that are equivalent to $\int_0^2 \int_0^{y^3} \int_0^{y^2} f(x, y, z) dz dx dy$.
4. Evaluate $\iint_D \frac{1}{1+x^2} dA$ if D is the triangular region with vertices $(0, 0)$, $(1, 1)$ and $(0, 1)$.
5. Evaluate $\int_0^3 \int_{-\sqrt{9-x^2}}^{\sqrt{9-x^2}} (x^2 + y^2) dy dx$.
6. Use a triple integral to find the volume of the region within the sphere $x^2 + y^2 + z^2 = 9$, outside the cone $z = \sqrt{x^2 + y^2}$, and above the xy -plane.