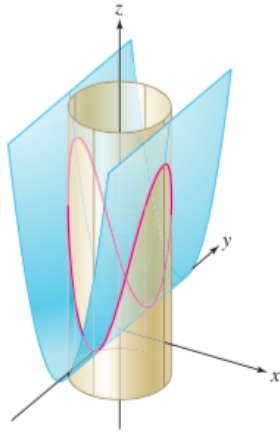


Worksheet for November 12

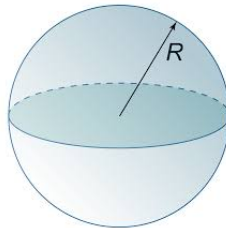
Problems marked with an asterisk are to be placed in your math diary.

(1.*) Calculate $\int_C xy(x^2 - y^2) ds$, where C is that portion of the curve below, lying in the first octant.



Intersection of the surfaces $x^2 + y^2 = 1$ and $z = 4x^2$.

(2.*) (i) Let C be the equator of the sphere S of radius R centered at $(0, 0, 0)$. Calculate $\int_C x^2 + y^2 + z^2 ds$, without using a parameterization. Check your answer using a parameterization.



(ii) What if C is another great circle?

(iii) What if C^* is a curve, not a great circle? The answer depends upon C^* . For example, calculate $\int_C x^2 + y^2 + z^2 ds$, if C^* is the circle on S obtained by setting $\phi = \frac{\pi}{3}$,