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[> restart: with(VectorCalculus) : SetCoordinates(cartesian[x, y, z]) :
> r := a · (1 + cos(theta))
                                      $r := a (1 + \cos(\theta))$  (1)
[
> ds := simplify(sqrt((diff(r, theta$1))^2 + r^2))
                                      $ds := \sqrt{2} \sqrt{a^2 (1 + \cos(\theta))}$  (2)
[
> M := int(ds, theta = 0..Pi)
                                      $M := 4 a \operatorname{csgn}(a)$  (3)
[
> Mx :=  $\frac{1}{M} \cdot \operatorname{int}(r \cdot \cos(\theta) \cdot ds, \theta = 0..Pi)$ 
                                      $Mx := \frac{4 a}{5}$  (4)
[
> My :=  $\frac{1}{M} \cdot \operatorname{int}(r \cdot \sin(\theta) \cdot ds, \theta = 0..Pi)$ 
                                      $My := \frac{4 a}{5}$  (5)
[>

```