c) Obliczyć objętości V elementu mierzonego oraz jej niepewność pomiarową uc(V), kulka

Tabela 1.7 Wartości pomocnicze do liczenia objętości i niepewności kulki.	
Dane	Wartosc[mm]
$u(\bar{d})$	0.067
$\bar{d}$	8.167

Obliczanie Objetosci

$$V = \frac{4}{3}\pi r^3 = \frac{4}{3}\pi(\frac{1}{2}d)^3 = \frac{4}{3}\pi\frac{1}{8}d^3 = \frac{1}{6}\pi d^3$$

$$V = \frac{1}{6}\pi d^3 = \frac{1}{6}\pi 8.167^3 = \frac{1}{6}\pi 544.73799 = 90.789666\pi \approx 285.00mm^3$$

Obliczanie Niepewnosci Objetosci

$$V = V(\bar{d})$$

$\frac{dV}{d\bar{d}}=\frac{dV}{d\bar{d}}=\frac{d}{d\bar{d}}\frac{1}{6}\pi\bar{d}^3 = \frac{1}{6}\pi 3\bar{d}^2 = \frac{1}{2}\pi\bar{d}^2$ $\frac{1}{2}\pi\bar{d}^2 = \frac{1}{2}\pi 66.69989 = 33.3499445\pi \approx 105$

$u_c(V) = \sqrt{(\frac{\partial V}{\partial\bar{d}}u(\bar{d}))^2}= \sqrt{(\frac{1}{2}\pi\bar{d}^2 * u(\bar{d}))^2}= \sqrt{(105 * 0.067)^2}= \sqrt{(7.035)^2}= \sqrt{49.491225} =$
$7.035 \approx 7.04mm^3$