3/4

A1) a) $\pm \dfrac{0{,}01\,m}{1{,}21\,m} \approx \pm 0{,}83\%$

Macht keinen Sinn!

b) $A = \pi r^2 = 4{,}60\ m^2 \pm 1{,}66\%$

$= 4{,}60\ m^2 \pm 0{,}076\ m^2$

Rechnung bitte dazuschreiben!

c) $V = \frac{4}{3}\pi r^3 = 7{,}42\ m^3 \pm 2{,}49\%$

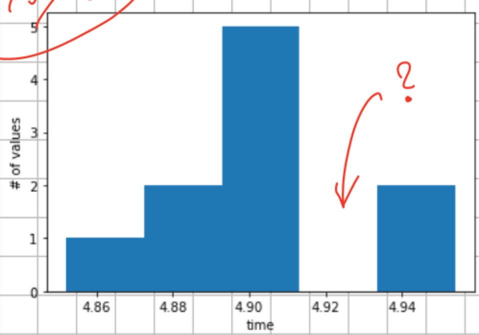
$7{,}4\ m^3 \pm 0{,}18\ m^3$

A2) 4/4

$$\sigma_a = \sqrt{\left(\frac{da}{dt}\right)^2\sigma_t^2 + \left(\frac{da}{dx}\right)^2\sigma_x^2} = \sqrt{\left(\frac{4x}{t^3}\right)^2\sigma_t^2 + \left(\frac{2}{t^2}\right)^2\sigma_x}$$

$$= \sqrt{16\frac{x^2}{t^6}\sigma_t^2 + \frac{4}{t^4}\sigma_x^2} = \frac{2}{t^2}\sqrt{4\frac{x^2}{t^2}\sigma_t^2 + \sigma_x^2}$$

A3) a) 5,5/6



Bins sinnvoll wählen!
Diese Darstellung repräsentiert nicht die Tabelle

?

$\#\text{Bins} = 5$

b) $\langle t \rangle = \sum_i \frac{t_i}{10} = 4{,}9011\,s$

$\sigma_t = \sqrt{\sum \frac{(t_i - \langle t \rangle)^2}{9}} \approx 0{,}02894\,s$

$\sigma_{\langle t \rangle} = \frac{\sigma_t}{\sqrt{10}} = 0{,}00915\,s$

c) Vier mal so oft, also 40 mal.

(evtl. kurz Rechnung dazuschreiben)

Ex_1

November 7, 2022

[4]:
```
import matplotlib.pyplot as plt
import numpy as np
%matplotlib inline

t = [4.892,4.936,4.894,4.911,4.954,4.895,4.897,4.873,4.907,4.852]

plt.hist(t, bins=5)
plt.ylabel('# of values')
plt.xlabel('time');

print(f"{np.mean(t)=}")
print(f"{np.std(t, ddof=1)=}")
print(f"{np.std(t, ddof=1)/np.sqrt(10)=}")
```

```
np.mean(t)=4.9011
np.std(t, ddof=1)=0.028938440409485l6
np.std(t, ddof=1)/np.sqrt(10)=0.009151138362702881
```