8p

9,7

① a- $v = \sqrt{\frac{5}{3}}\, p^{\frac{1}{2}} q^{-\frac{1}{2}}$

$\left(\frac{\Delta v}{v}\right)^2 = \left(\frac{1}{2}\right)^2 \left(\frac{0,01}{1,01}\right)^2 + \left(-\frac{1}{2}\right)^2 \left(\frac{0,02}{1,21}\right)^2 \Rightarrow \frac{\Delta v}{v} = 9,6 \times 10^{-3} = 0,01$

4

b- $v = \sqrt{\frac{5 \times 1,01}{3 \times 1,21}} = 1,18$

$\Delta v = 1,18 \times 0,0096 = 0,011 = 0,02$

4

$v = (1,18 \pm 0,02)$ m/s

12. (2)

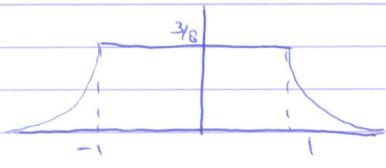
a) 5 $A \cdot 1 + \int_1^\infty \frac{A}{x^4}\,dx = \frac{1}{2}$ want symmetrisch ✓

$A + A\int_1^\infty \frac{1}{x^4}\,dx = \frac{1}{2}$

$A + A\left[-\frac{1}{3}x^{-3}\right]_1^\infty = \frac{1}{2}$

$A + A\left((0) - (-\frac{1}{3})\right) = \frac{1}{2}$

$A + \frac{1}{3}A = \frac{1}{2}$



$1\frac{1}{3}A = \frac{1}{2}$

$A = \frac{3}{8}$

b) $\overline{x} = 0$ want symmetrisch in y-as ✓

4 $\overline{x}^2 = 0$

$\overline{x^2} = 2\left(\frac{3}{8}\int_0^1 x^2\,dx + \frac{3}{8}\int_1^\infty \frac{1}{x^2}\,dx\right)$

$= 2\left(\frac{3}{8}\left[\frac{1}{3}x^3\right]_0^1 + \frac{3}{8}\left[-\frac{1}{x}\right]_1^\infty\right)$

$= 2\left(\left(\frac{1}{8} - 0\right)\left(0 + \frac{3}{8}\right)\right) = 2 \cdot \frac{1}{2} = 1$

$\sigma^2 = \overline{x^2} - \overline{x}^2 = 1 - 0 = 1$

$\sigma = \sqrt{1} = 1$

c) minder dan de standaard deviatie:

3 $\int_{-1}^{1} \frac{3}{8}\,dx = \left[\frac{3}{8}x\right]_{-1}^{1} = \frac{6}{8}$

meer dan de standaard deviatie:

$1 - \frac{6}{8} = \frac{1}{4}$ want totale kans = 1.

③ $$\frac{24,3 \times \frac{1}{0,6^2} + 24,7 \times \frac{1}{0,2^2}}{\frac{1}{0,6^2} + \frac{1}{0,2^2}} = 24,66 = 24,7$$

$$\frac{1}{0,6^2} \quad \frac{1}{0,2^2} =$$

$$\Delta M = \sqrt{\frac{1}{\frac{1}{0,6^2} + \frac{1}{0,2^2}}} = 0,219 = 0,2$$

$M = (24,7 \pm 0,2)\ kg$

(4) 8 1/2

a- $\frac{5,9+5,0+6,2+5,4+6,3}{5} = 5,76 = 5,8\ \Omega$

2

b- $S_x^2 = \frac{N}{N-1}\left(\overline{x^2} - \bar{x}^2\right)$

$\overline{x^2} = 33,42$

$\bar{x}^2 = 33,18$

2

$S_x = \sqrt{\frac{5}{4}(0,24)} = 0,55\ \Omega$

c- $S_m = \frac{S_x}{\sqrt{N}} = \frac{0,55}{\sqrt{5}} = 0,25 = 0,3\ \Omega$

2

d- $S_m = \frac{1}{2}\cdot\frac{S_x}{\sqrt{N}} = \frac{1}{\sqrt{4}}\cdot\frac{S_x}{\sqrt{N}} = \frac{S_x}{\sqrt{4N}} \Rightarrow \frac{S_x}{\sqrt{20}} \Rightarrow N = 20$

2 $20-5 = 15$ extra metingen

e- $\int_{5,0-0,3}^{5,0+0,3} f(x)dx$ waarbij $f(x)$ de verdelingsfunctie is. (die je niet weet :)

1/2 $= \oint \int_{5,5}^{6,1} f(x)dx$

(8)

⑤ $a = \dfrac{\overline{xy} - \bar{x}\bar{y}}{\overline{x^2} - \bar{x}^2}$ 3

$x = T$	
$y = R$	
$a = \alpha$	3
$b = R_0$	

2 $\bar{x} = -30$ 3 $\quad \bar{x}^2 = 900$ 3

$\bar{y} = 88,18$ 3

$\overline{xy} = -2565,4$ 3

$\overline{x^2} = 1100$ 3

3 $a = \dfrac{-2565,4 + 30 \times 88,18}{1100 - 900} = 0,4 \ \Omega \, ^\circ C^{-1}$

$\bar{y} = b + a\bar{x}$

3 $b = \bar{y} - a\bar{x} = 88,18 - 0,4 \times -30 = 100,18 \ \Omega$

$\alpha = 0,4 \ \Omega \, ^\circ C^{-1} \quad R_0 = 100,2 \ \Omega$ 3