

TBM 4E, 14.4.2015

$$\textcircled{1} \quad b: \quad \frac{a}{a+b} = \frac{e}{f} \quad / \cdot f$$

$$\frac{a+b}{a} = \frac{f}{e} \quad / - a$$

$$a+b = \frac{af}{e} \quad / - a$$

$$b = \frac{af}{e} - a = \frac{30 \cdot 42}{30} - 30$$

$$= \underline{\underline{12m}}$$

$$c: \quad \frac{c}{c+d} = \frac{e}{f} \quad / \cdot f$$

$$\frac{c+d}{c} = \frac{f}{e} \quad / - c$$

$$c+d = \frac{cf}{e} \quad / - c$$

$$d = \frac{cf}{e} - c$$

$$d = c \left(\frac{f}{e} - 1 \right)$$

$$\frac{d}{\frac{f}{e} - 1} = c$$

$$\frac{38}{\frac{42}{30} - 1} = \frac{38}{\frac{7}{5} - 1} = \frac{38}{\frac{2}{5}} = \frac{5 \cdot 38}{2} = \underline{\underline{95m}}$$

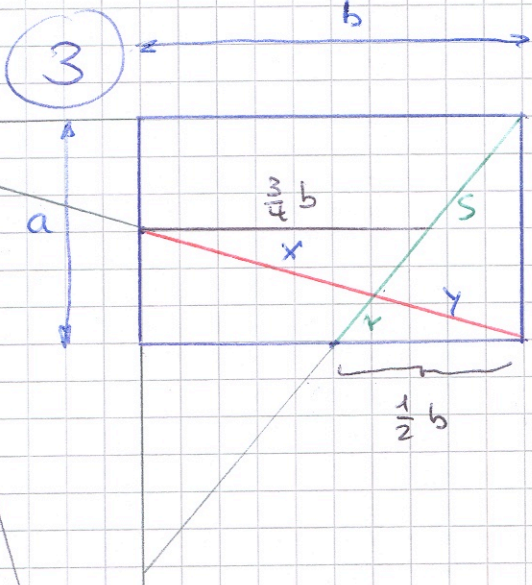
$$\textcircled{2} \quad \frac{a}{a+x} = \frac{6-1.5}{13.5-1.5} = \frac{4.5}{12} = \frac{9}{24} = \frac{3}{8}$$

$$\frac{a+x}{a} = \frac{8}{3}$$

$$x = \frac{8}{3}a - a = \frac{5}{3}a = \underline{\underline{5m}}$$

$$\frac{y}{3} = \frac{7}{x} = \frac{7}{5}$$

$$y = \frac{21}{5} = \underline{\underline{4.2m}}$$



$$\frac{\frac{3}{2}a}{a} = \frac{x}{y}$$

$$\underline{\underline{3:2 = x:y}}$$

$$\frac{\frac{1}{2}b}{\frac{3}{4}b} = \frac{r}{\frac{1}{2}s}$$

$$\frac{2}{3} = \frac{2r}{s} \quad | :2$$

$$\frac{1}{3} = \frac{r}{s}$$

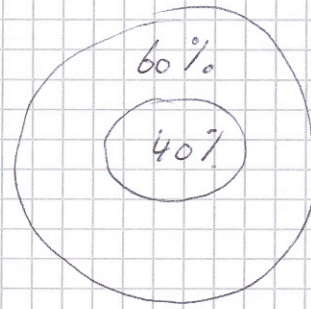
$$\frac{\frac{1}{2}b}{2b} = \frac{r}{s}$$

$$\frac{1}{4} = \frac{r}{s}$$

$$\underline{\underline{r:s = 1:4}}$$

4

$$\left(\frac{r_1}{r_2}\right)^2 = \frac{40}{100} = \frac{10}{25} = \frac{2}{5}$$



$$\frac{r_1}{r_2} = \sqrt{\frac{2}{5}}$$

$$r_1 = r_2 \cdot \sqrt{\frac{2}{5}} \approx 1.26491 \text{ m} \approx \underline{\underline{1.265 \text{ m}}}$$

5) 1.) $\frac{r_1^2}{r_2^2} = \frac{2}{5}$ (wie bei 4)

2.) $r_2 - r_1 = 1 \text{ m}$
 $r_2 = 1 + r_1$

} 2 Gl.,
 2 Unbek.,
 nicht-lin. Gl.-Sgs.

einsetzen in 1.)

$$\frac{r_1^2}{(1+r_1)^2} = \frac{2}{5} = 0.4 \quad | \cdot (1+r_1)^2$$

$$r_1^2 = 0.4(1+r_1)^2$$

$$= 0.4(1+2r_1+r_1^2) \quad | \cdot 5$$

$$5r_1^2 = 2(1+2r_1+r_1^2)$$

$$5r_1^2 = 2 + 4r_1 + 2r_1^2$$

$$3r_1^2 - 4r_1 - 2 = 0$$

~~QWE~~

$$3r_1^2 + 4r_1 - 2 = 0$$

$$r_1 = \frac{-4 \pm \sqrt{16 + 24}}{6}$$

$$= \frac{-4 \pm 2\sqrt{10}}{6} = -\frac{2}{3} \pm \frac{\sqrt{10}}{3}$$

$$r_1 \approx 0.38743 \text{ m}$$

$$\approx 0.387 \text{ m}$$

$$r_2 = 1.387 \text{ m}$$

5

$$\frac{40}{100} = \frac{\sqrt{r_1^2}}{\sqrt{r_2^2}}$$

$$\frac{2}{5} = \frac{r_1^2}{r_2^2}$$

$$\frac{2}{5} = \frac{r_1^2}{(r_1+1)^2} \quad | \cdot 5$$

$$2 = \frac{5r_1^2}{(r_1+1)^2} \quad | \cdot (r_1+1)^2$$

$$2(r_1+1)^2 = 5r_1^2$$

$$2r_1^2 + 4r_1 + 2 = 5r_1^2$$

$$0 = 3r_1^2 - 4r_1 - 2$$

$$r_1 = \frac{4 \pm \sqrt{4^2 + 24}}{6} = \frac{4 \pm 2\sqrt{10}}{6}$$

$$= \frac{2}{3} \pm \frac{1}{3}\sqrt{10}$$

pos. Lösung: $r_1 = 1.721 \text{ m}$

$$r_2 = 2.721 \text{ m}$$

$$r_2 - r_1 = 1$$

$$r_2 = r_1 + 1$$