Lösungen Abschlusstraining 2

1. a) $\frac{8x-2y}{4(x+y)}+\frac{4{,}5y-3x}{3(x+y)}$

$=\frac{3(8x-2y)+4(4{,}5y-3x)}{12(x+y)}$

$=\frac{24x-6y+18y-12x}{12(x+y)}$

$=\frac{12x+12y}{12(x+y)}=\frac{12(x+y)}{12(x+y)}=\underline{\underline{1}}$

b)

$$\frac{8x-3}{8}-\frac{3+2x}{3} < 0 \qquad /\cdot 24$$

$$3(8x-3)-8(3+2x) < 0$$

$$24x-9-24-16x < 0$$

$$8x-33 < 0 \qquad /+33$$

$$8x < 33 \qquad /:8$$

$$x < 4{,}125$$

$$\underline{\underline{L = \{1; 2; 3; 4 \ldots\}}}$$

2. a)

$$\frac{5}{(x+3)(x-3)}-\frac{3}{(x-3)(x-3)} = 0 \qquad /\cdot (x+3)(x-3)(x-3) \quad \underline{x \neq 3 \quad x \neq -3}$$

$$5(x-3)-3(x+3) = 0$$

$$5x-15-3x-9 = 0$$

$$2x-24 = 0 \qquad /+24$$

$$2x = 24 \qquad /:2$$

$$\underline{\underline{x = 12}}$$

b)

	Anzahl Zelte	Anzahl Schlafplätze
4er-Zelte	x	$4x$
6er-Zelte	$39 - x$	$6(39 - x)$
Total	39	

$$\frac{4x}{3} - 13 = \frac{6(39-x)}{2} \qquad /\cdot 6$$

$$8x - 78 = 18(39 - x)$$

$$8x - 78 = 702 - 18x \qquad /+18x$$

$$26x - 78 = 702 \qquad /+78$$

$$26x = 780 \qquad /:26$$

$$x = 30 \qquad /:26$$

Es hat <u>30 4er-Zelte und 9 6er-Zelte</u>.

3. $$\frac{a^2-2abc+(bc)^2}{\frac{a}{c}-\frac{a+ab}{a+c}} \cdot \left(\frac{1}{c}+\frac{b}{a-bc}\right) =$$

$$a^2 - 2abc + (bc)^2 = (a - bc)(a - bc)$$

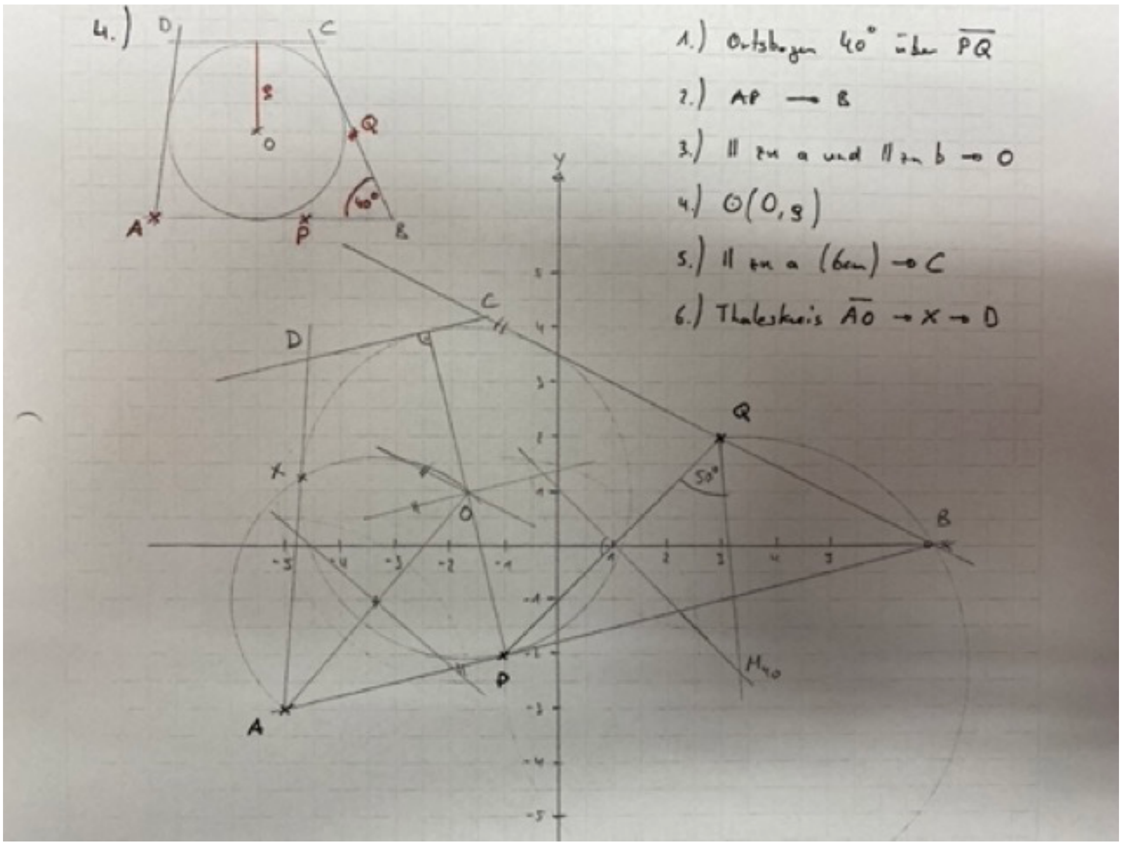
$$\frac{a}{c} - \frac{a+ab}{a+c} = \frac{a(a+c)-c(a+ab)}{c(a+c)} = \frac{a^2+ac-ac-abc}{c(a+c)} = \frac{a^2-abc}{c(a+c)} = \frac{a(a-bc)}{c(a+c)}$$

$$\frac{(a-bc)(a-bc)}{\frac{a(a-bc)}{c(a+c)}} = \frac{(a-bc)(a-bc)\cdot c(a+c)}{a(a-bc)} = \frac{(a-bc)\cdot c(a+c)}{a}$$

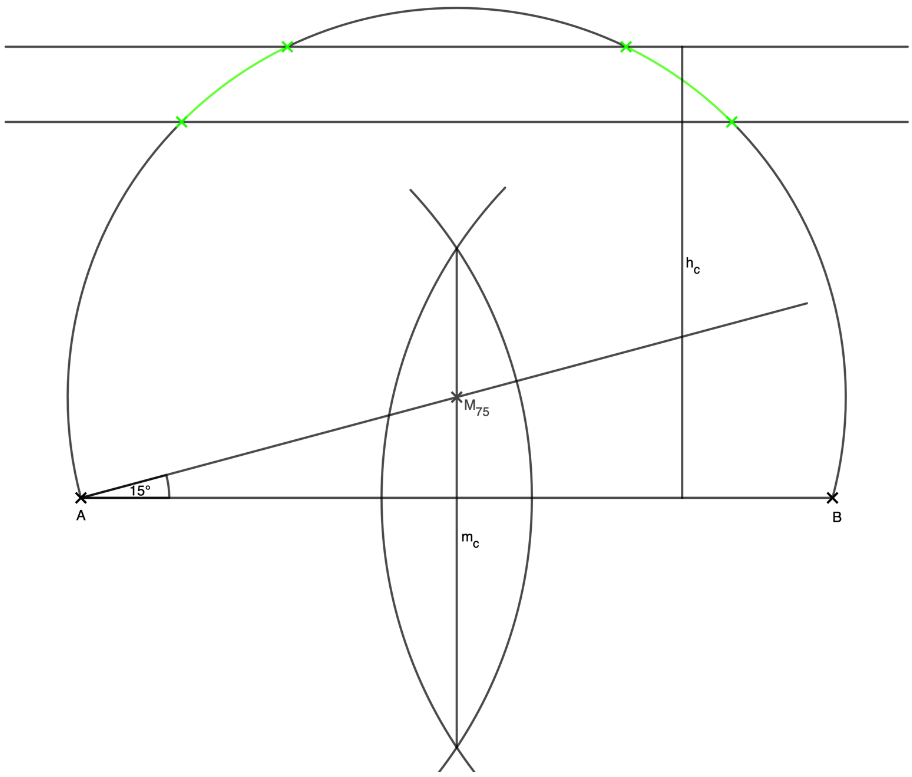
$$\left(\frac{1}{c}+\frac{b}{a-bc}\right) = \frac{a-bc+bc}{c(a-bc)} = \frac{a}{c(a-bc)}$$

$$\frac{(a-bc)\cdot c(a+c)}{a} \cdot \frac{a}{c(a-bc)} = \underline{\underline{a + c}}$$

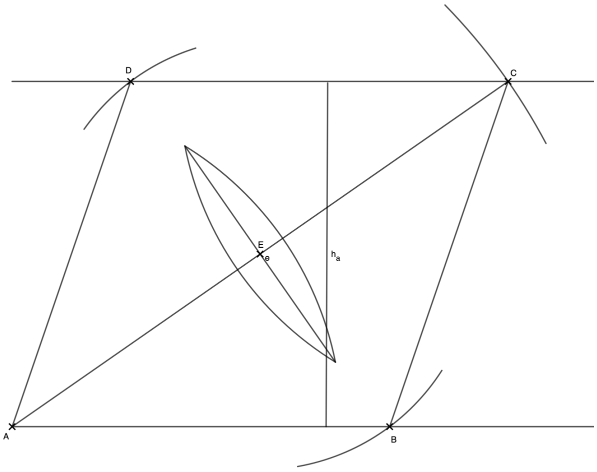
4.



5. a) KB: 1. $c \rightarrow A, B$
2. $Höhenstreifen\ h_c$ ($5cm$ und $6cm$)
3. $Ortsbogen$ $75°$ über $\overline{AB} \rightarrow Ortbereich$ $f$ür C



b) KB:
1. $Höhenstreifen\ h_a$
2. $\odot\ (A, e) \rightarrow C$
3. $m_e \rightarrow E$
4. $\odot\ \left(E, \frac{f}{2}\right) \rightarrow B, D$



6. 2700m

$v_1 = 50\frac{m}{s}$ $t_1 = x$ $s_1 = v_1 \cdot t_1$

y m

$v_2 = 3\frac{m}{s}$ $t_2 = 195 - x$ $s_2 = v_2 \cdot t_2$

0 m

$$s_{Total} = s_1 + s_2$$

$$2700 = 50 \cdot x + 3(195 - x)$$

$$2700 = 50x + 585 - 3x \qquad /-585$$

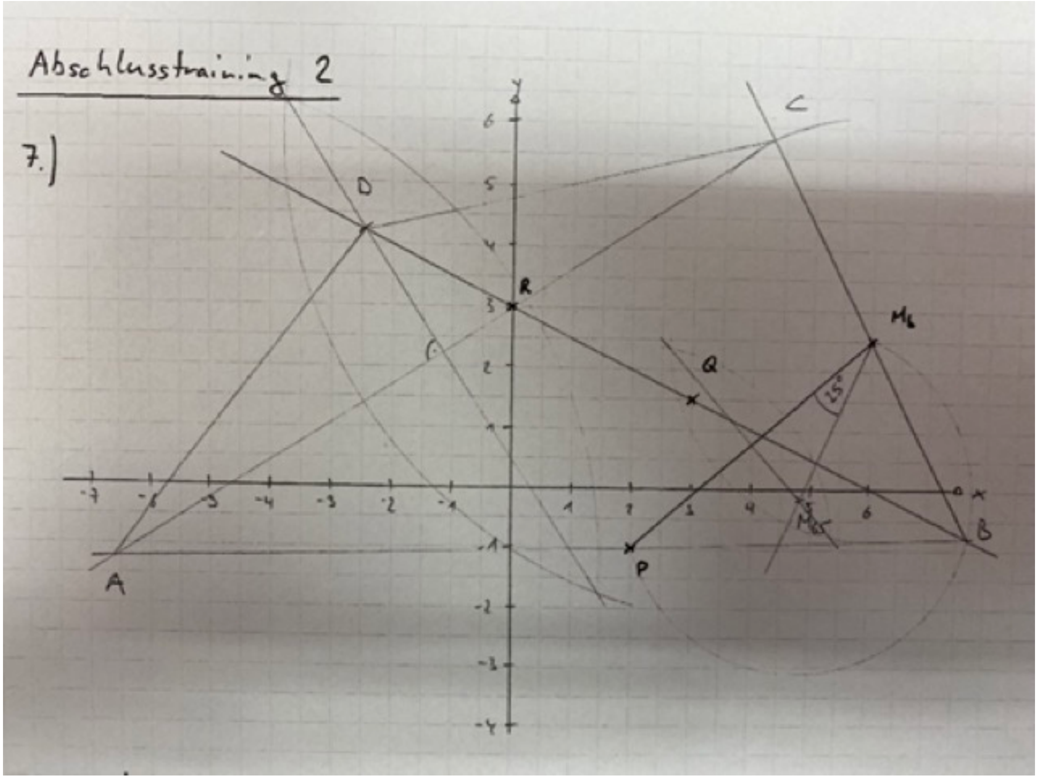
$$2115 = 47x \qquad /:47$$

$$\underline{45 = x}$$

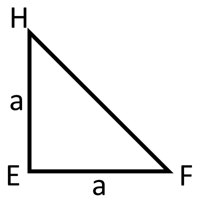
$s_2 = v_2 \cdot t_2 = 3 \cdot (195 - 45) = 450m$

Er muss den Schirm nach <u>45s</u> öffnen, er ist dann <u>450m</u> über Boden.

7.

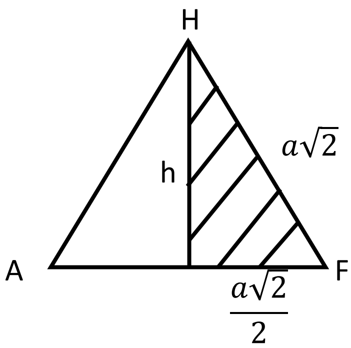


8. a)



$\overline{HF} = \sqrt{a^2 + a^2} = \sqrt{2a^2} = \underline{a\sqrt{2}}$

$A_1 = \frac{a^2}{2}$



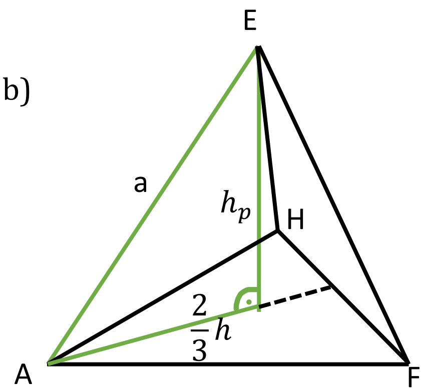
$h = \sqrt{\left(a\sqrt{2}\right)^2 - \left(\frac{a\sqrt{2}}{2}\right)^2} = \sqrt{2a^2 - \frac{2a^2}{4}} = \sqrt{\frac{4a^2}{2} - \frac{a^2}{2}} = \sqrt{\frac{3a^2}{2}}$

$h = \frac{a\sqrt{3}}{2}$

$A_2 = \frac{a\sqrt{2}}{2} \cdot \frac{a\sqrt{3}}{2} = \frac{a^2\sqrt{6}}{4}$

$\underline{\underline{O}} = 3 \cdot A_1 + A_2 = \underline{\underline{\frac{3a^2}{2} + \frac{a^2\sqrt{6}}{4}}}$

b)



$\frac{2}{3}h\ (wegen\ Schwerlinie.) = \frac{2}{3} \cdot \frac{a\sqrt{3}}{2} = \frac{a\sqrt{3}}{3}$

$h_p = \sqrt{a^2 - \left(\frac{2}{3}h\right)^2} = \sqrt{a^2 - \left(\frac{a\sqrt{3}}{3}\right)^2} = \sqrt{a^2 - \frac{3a^2}{9}} =$

$\sqrt{\frac{9a^2}{9} - \frac{3a^2}{9}} = \sqrt{\frac{6a^2}{9}} = \underline{\underline{\frac{a\sqrt{6}}{3}}}$