

Lösungen Aufnahmeprüfung 2012

1.) Feriengeld = Feriengeld

$$d \cdot 24.5 = (d + 3) \cdot 21$$

$$24.5d = 21d + 63$$

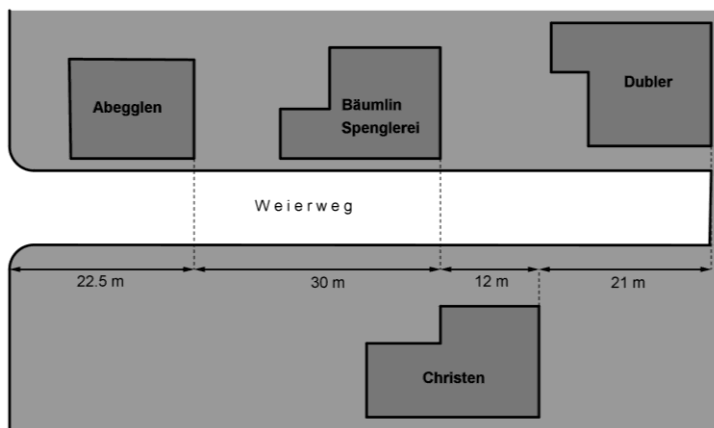
$$3.5d = 63$$

$$d = \frac{63}{3.5} = 18$$

$$\underbrace{18 \cdot 24.5}_{441} = \underbrace{21 \cdot 21}_{441}$$

$$\text{Feriengeld} = \underline{\underline{441.-}}$$

2.a

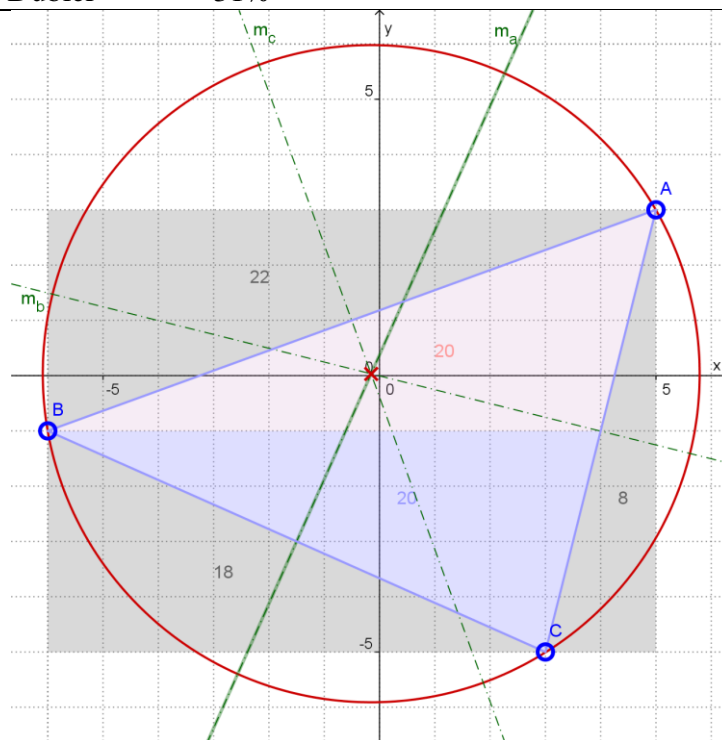


$$100\% = A + 2 \cdot B + C + D$$

	Distanz	Wegteil	Anteile	%
A	22.5	22.5	$\frac{22.5}{277.5}$	8.1
B	52.5	105	$\frac{105}{277.5}$	37.8
C	64.5	64.5	$\frac{64.5}{277.5}$	23.2
D	85.5	85.5	$\frac{85.5}{277.5}$	30.8

2.b
 Abegglen: 8%
 Bäumlin: 38%
 Christen: 23%
 Dubler: 31%

3.



Rechteck-3 Dreiecke:

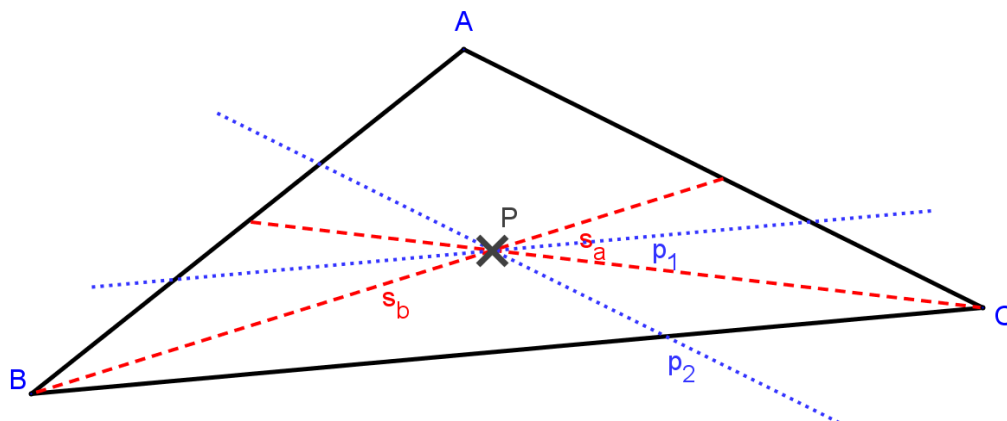
$$8 \cdot 11 - \left(\frac{4 \cdot 11}{2} + \frac{2 \cdot 8}{2} + \frac{9 \cdot 4}{2} \right) = 40$$

2 Dreiecke:

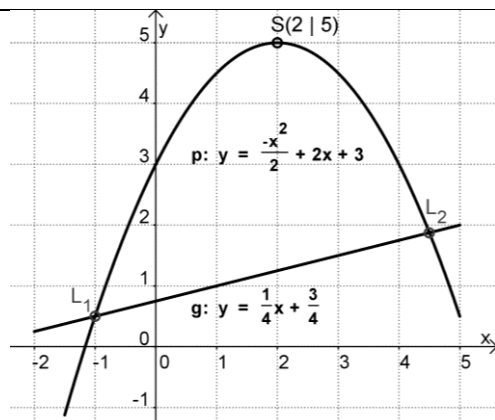
$$\frac{10 \cdot 4}{2} + \frac{10 \cdot 4}{2} = 40$$

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4.



5.a



$$\underbrace{\frac{-(4.5)^2}{2}}_{\frac{-81}{8} = -10.25} + \underbrace{2 \cdot (4.5)}_9 + 3 = \underbrace{\frac{1}{4} \cdot (4.5)}_{\frac{9}{8} = 1.125} + \frac{3}{4}$$

$$\frac{15}{8} = 1.625 \qquad \frac{15}{8} = 2.625$$

5.b

$$\frac{-1.9^2}{2} + 2 \cdot 1.9 + 3 = 4.995 < 5$$

-1.085 3.8

$$\frac{-2.1^2}{2} + 2 \cdot 2.1 + 3 = 4.995 < 5$$

-2.205 4.2

6.a

$$\frac{7}{3 + \sqrt{2}} \approx 1.585786$$

$$3 - \sqrt{2} \approx 1.585786$$

$$\frac{3\sqrt{2} - 2}{\sqrt{2}} \approx 1.585786$$

$$\sqrt{2} + \frac{\sqrt{3}}{10} \approx 1.58742$$

b)

$$\frac{2 \cdot \overbrace{((-3) + 5)}^4}{\underbrace{(-3)^2 + 3 \cdot (-3) - 10}_{-10}} \stackrel{?}{=} \frac{2}{\underbrace{(-3) - 2}_{-5}}$$

c)

$$\underbrace{6xy - 10x + 3y - 5}_{3y(2x+1) - 5(2x-1) = (3y-5)(2x-1)} \stackrel{?}{=} \underbrace{(2x-1)(3y+5)}_{6xy + 10x - 3y - 5}$$

7.a)

$$A = \overbrace{a^2 - b^2}^{\text{Differenz}} = \overbrace{(a+b) \cdot (a-b)}^{\text{Produkt}}$$

$$= (14 + (x-1)) \cdot (14 - (x-1))$$

$$= \underline{\underline{(13+x) \cdot (15-x)}}$$

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7b)

$$A = (13 + x) \cdot (15 - x)$$

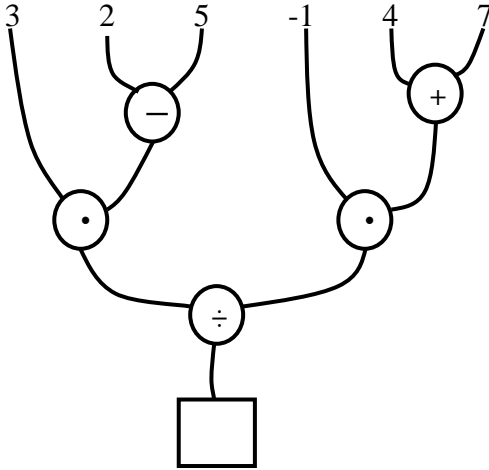
$$(13 + x) > 0 \quad \wedge \quad (15 - x) > 0$$

$$x > -13 \quad \wedge \quad 15 > x$$

$$x \in \{-12, -11, -10, \dots, 14\}$$

□

8



$$\frac{\overbrace{3 \cdot (2-5)}^{-9}}{\underbrace{-1 \cdot (4+7)}_{-11}} = \frac{9}{11} = 0.\overline{81} \approx 0.82$$

9

$$5 \text{ cm} = 0.05 \text{ m}$$

$$8.4 \frac{\text{kg}}{\text{dm}^3} = 8.4 \cdot 10^6 \frac{\text{g}}{\text{m}^3}$$

Ansatz Ni-Würfel mit Ni überziehen:

$$m = 0.05^3 \cdot 8.4 \cdot 10^6 = 1050 \text{ g}$$

$$V_{\text{neu}} = \frac{1052 \text{ g}}{8.4 \cdot 10^6 \frac{\text{g}}{\text{m}^3}} = 0.0012524 \text{ m}^3$$

$$s_{\text{neu}} = \sqrt[3]{0.0012524} \approx 0.0500317$$

$$\frac{s_{\text{neu}} - s}{2} = \frac{0.0000317}{2} \approx 0.0000159$$

$$\approx 15.9 \cdot 10^6 \text{ m} \approx \underline{\underline{16 \mu\text{m}}}$$

Ansatz "Folienüberzug":

$$V_{\text{Ni}} = \frac{2 \text{ g}}{8.4 \cdot 10^6 \frac{\text{g}}{\text{m}^3}} = 0.2381 \cdot 10^{-6} \text{ m}^3$$

$$O_w = 6 \cdot 0.05^2 = 0.015 \text{ m}^2$$

$$d = \frac{V_{\text{Ni}}}{O_w} = \frac{0.2381 \cdot 10^{-6} \text{ m}^3}{0.015 \text{ m}^2} = 15.87 \cdot 10^{-6} \text{ m} \approx \underline{\underline{16 \mu\text{m}}}$$

□

10

$$\frac{3(2-x)}{5} + 1 = \frac{3}{4}(3x-2) - \frac{39}{10} \quad \text{mit } G = \mathbb{N}_0$$

$$\frac{6}{5} - \frac{3x}{5} + \frac{5}{5} = \frac{9x}{4} - \frac{3 \cdot 5}{2 \cdot 5} - \frac{39}{10}$$

$$\frac{11}{5} - \frac{3x}{5} = \frac{9x}{4} - \frac{54}{10}$$

$$\frac{2 \cdot 11}{2 \cdot 5} + \frac{54}{10} = \frac{5 \cdot 9x}{5 \cdot 4} + \frac{4 \cdot 3x}{4 \cdot 5}$$

$$\frac{76}{10} = \frac{57}{20} x$$

$$\frac{76 \cdot 20^2}{10 \cdot 57 \cdot 3} = x = \frac{8}{3} \notin \mathbb{N}$$

$$L = \emptyset$$