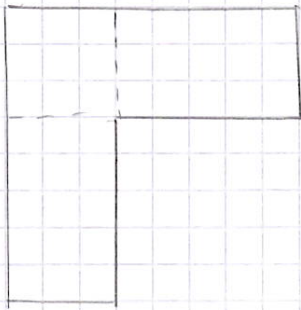


S. 17/6

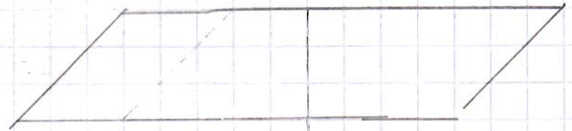
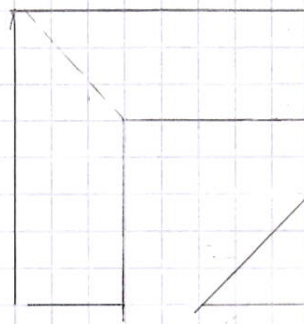
a) Rechteck

z.B.:



b) Parallelogramm

z.B.

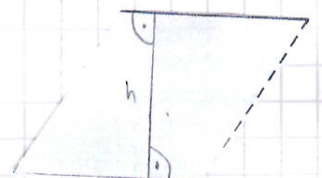
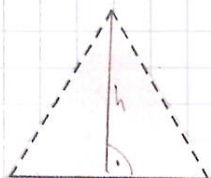
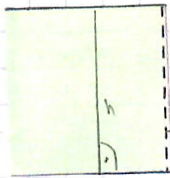


c) z.B. Trapez : Schnitt wie Parallelogramm

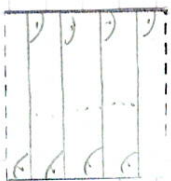
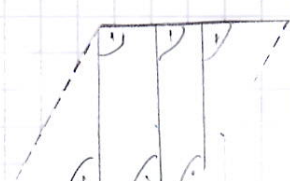
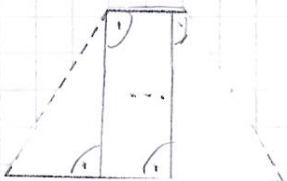


S. 18/2

sie haben alle die gleiche Höhe h



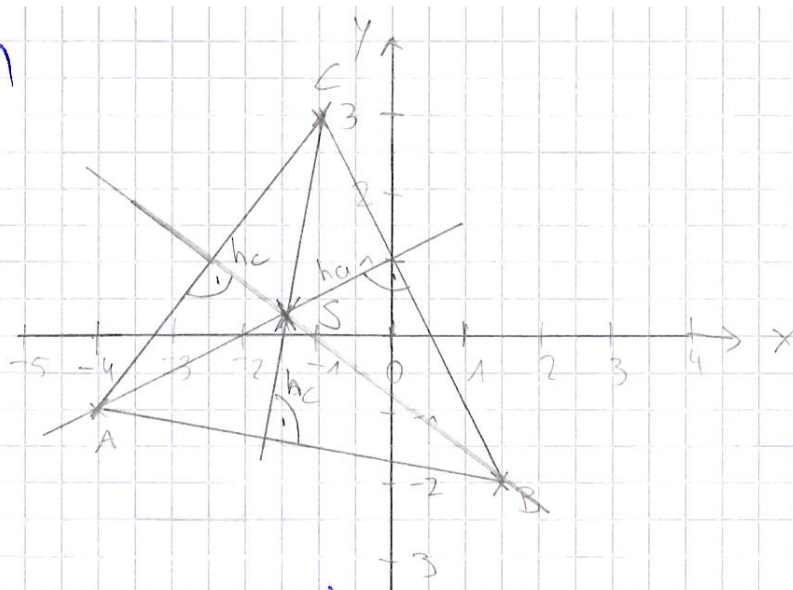
Die alternativen Höhen



beliebig viele Höhen
zwischen den parallelen Seiten

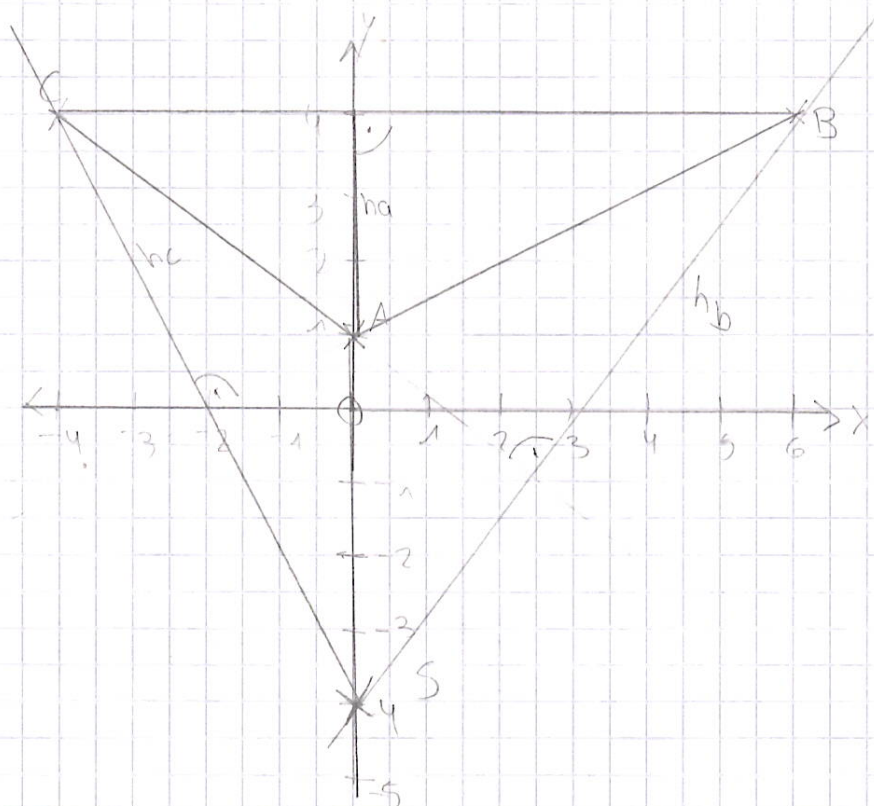
jeweils nur eine Höhe
pro Seite

S. 19/5 a)



$S(-1,5 | 0,25)$

b)



$S(0 | -4)$

S. 21/4

a) $a = 24 \text{ cm}$ $h_a = 25 \text{ cm}$

$$A = \frac{1}{2} \cdot a \cdot h_a = \frac{1}{2} \cdot 24 \text{ cm} \cdot 25 \text{ cm} = \underline{\underline{300 \text{ cm}^2}}$$

$$h_b = 15 \text{ cm}$$

$$A = \frac{1}{2} \cdot b \cdot h_b \Rightarrow b = \frac{2 \cdot A}{h_b} = \frac{2 \cdot 300 \text{ cm}^2}{15 \text{ cm}} = \underline{\underline{40 \text{ cm}}}$$

b) $a = 4,56 \text{ m}$ $b = 3,80 \text{ m}$ $h_b = 90 \text{ cm} = 0,9 \text{ m}$

$$A = \frac{1}{2} \cdot b \cdot h_b = \frac{1}{2} \cdot 3,80 \text{ m} \cdot 0,9 \text{ m} = \underline{\underline{1,71 \text{ m}^2}}$$

$$A = \frac{1}{2} \cdot a \cdot h_a \Rightarrow h_a = \frac{2 \cdot A}{a} = \frac{2 \cdot 1,71 \text{ m}^2}{4,56 \text{ m}} = \underline{0,75 \text{ m}}$$

$$c) \quad b = 3,75 \text{ m} \quad h_a = 54 \text{ dm} = 5,4 \text{ m} \quad A = 27,0 \text{ m}^2$$

$$A = \frac{1}{2} \cdot h_b \cdot b \Rightarrow h_b = \frac{2 \cdot A}{b} = \frac{2 \cdot 27,0 \text{ m}^2}{3,75 \text{ m}} = \underline{14,4 \text{ m}}$$

$$A = \frac{1}{2} h_a \cdot a \Rightarrow a = \frac{2 \cdot A}{h_a} = \frac{2 \cdot 27,0 \text{ m}^2}{5,4 \text{ m}} = \underline{10 \text{ m}}$$

$$d) \quad a = 2 \cdot b \quad h_a = 18 \text{ mm} = 1,8 \text{ cm} \quad A = 20,88 \text{ cm}^2$$

$$A = \frac{1}{2} h_a \cdot a \Rightarrow a = \frac{2 \cdot A}{h_a} = \frac{2 \cdot 20,88 \text{ cm}^2}{1,8 \text{ cm}} = \underline{23,2 \text{ cm}}$$

$$a = 2b \Rightarrow b = \frac{a}{2} = 23,2 \text{ cm} : 2 = \underline{11,6 \text{ cm}}$$

$$A = \frac{1}{2} h_b \cdot b \Rightarrow h_b = \frac{2 \cdot A}{b} = \frac{2 \cdot 20,88 \text{ cm}^2}{11,6 \text{ cm}} = \underline{3,6 \text{ cm}}$$

$$e) \quad b = 3 \cdot a \quad h_a = 75 \text{ dm} \quad A = 24 \text{ dm}^2$$

$$A = \frac{1}{2} a \cdot h_a \Rightarrow a = \frac{2 \cdot A}{h_a} = \frac{2 \cdot 24 \text{ dm}^2}{75 \text{ dm}} = \underline{0,64 \text{ dm}}$$

$$b = 3 \cdot a = 3 \cdot 0,64 \text{ dm} = \underline{1,92 \text{ dm}}$$

$$A = \frac{1}{2} h_b \cdot b \Rightarrow h_b = \frac{2 \cdot A}{b} = \frac{2 \cdot 24 \text{ dm}^2}{1,92 \text{ dm}} = \underline{25 \text{ dm}}$$

$$s. 180/4$$

$$a) \quad p: y = -x^2 + 4x + 2$$

$$g: y = -4x + 2$$

$$\text{I) } -x^2 + 4x + 2 = 0$$

$$\text{II) } -4x + 2 = 0$$

$$\text{I} = \text{II) } -x^2 + 4x + 2 = -4x + 2 \quad | +4x$$

$$-x^2 + 8x + 2 = 2 \quad | -2 \quad (*)$$

$$-x^2 + 8x = 0$$

$$D = 8^2 - 4 \cdot (-1) \cdot 0 = 64 - 0 > 0$$

$$\Rightarrow 1 \text{ Lösungen} \Rightarrow \text{Sekante}$$

$$x_{1/2} = \frac{-8 \pm \sqrt{64}}{2 \cdot (-1)} = \frac{-8 \pm 8}{-2}$$

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$$x_1 = \frac{-8+8}{-2} = 0$$

$$x_2 = \frac{-8-8}{-2} = \frac{-16}{-2} = 8$$

Δ in Π : (oder I)

$$y_1 = -4 \cdot 0 + 2 = 2$$

$$y_2 = -4 \cdot (8) + 2 = -32 + 2 = -30$$

$$\Rightarrow S_1(0|2) \quad S_2(8|-30)$$

b) p: $y = -x^2 + 8x - 13$

g: $y = -2x + 12$

I) $-x^2 + 8x - 13 = 0$

II) $-2x + 12 = 0$

I) = II)

$$-x^2 + 8x - 13 = -2x + 12 \quad | -12$$

$$-x^2 + 8x - 25 = -2x \quad | +2x$$

$$-x^2 + 10x - 25 = 0$$

$$D = 10^2 - 4 \cdot (-1) \cdot (-25) = 100 - 100 = 0$$

$\Rightarrow$ Tangente

$$x = \frac{-10 \pm 0}{2 \cdot (-1)} = \frac{-10}{-2} = 5$$

$\Rightarrow$ in II) oder I

$$y = -2 \cdot (5) + 12 = -10 + 12 = 2$$

$$\Rightarrow S(5|2)$$

c) g: $y = -6x - 2$

p: $y = x^2 - 2x + 2$

I) $-6x - 2 = 0$

II) $x^2 - 2x + 2 = 0$

I=II): $x^2 - 2x + 2 = -6x - 2 \quad | +6x$

$$x^2 + 4x + 2 = -2 \quad | +2$$

$$x^2 + 4x + 4 = 0$$

$$D = 4^2 - 4 \cdot 1 \cdot 4 = 16 - 16 = 0$$

$\Rightarrow$ eine Lösung $\Rightarrow$ Tangente

S.

a)

b)

$$x = \frac{-4 \pm 0}{2 \cdot 1} = -2$$

in I) oder II)

$$y = -6 \cdot (-2) - 2 = 12 - 2 = 10$$

$$\Rightarrow S(-2|10)$$

d) p: $y = -(x-4)^2$

g: $y = 6x - 14$

I) $-(x-4)^2 = 0$

II) $6x - 14 = 0$

I = II: $-(x-4)^2 = 6x - 14$

oder

hier

weiter

ausmultiplizieren,

der Schritt muss nicht ausgeschrieben werden, wer nicht so sicher ist macht den Zwischenschritt / die Zwischenschritte

$$-(x-4)(x-4) = 6x - 14$$

$$-(x^2 - 4x - 4x + 16) = 6x - 14$$

$$-(x^2 - 8x + 16) = 6x - 14$$

$$-x^2 + 8x - 16 = 6x - 14 \quad | +14$$

$$-x^2 + 8x - 2 = 6x \quad | -6x$$

$$-x^2 + 2x - 2 = 0$$

$$D = 2^2 - 4 \cdot (-1) \cdot (-2) = 4 - 8 = -4 < 0$$

$\Rightarrow$ keine Lösung $\Rightarrow$ Passante

S. 179/2

a) p: $y = x^2 - 4$

g: $y = -\frac{2}{3}x + \frac{4}{3}$

bzw. $y = -0,6x + 1,3$

I) $x^2 - 4 = 0$

II) $-\frac{2}{3}x + \frac{4}{3} = 0$

I = II) $x^2 - 4 = -\frac{2}{3}x + \frac{4}{3} \quad | \cdot 3$

$$3x^2 - 12 = -2x + 4 \quad | +2x$$

$$3x^2 + 2x - 12 = 4 \quad | -4$$

$$3x^2 + 2x - 16 = 0$$

$$x_{1/2} = \frac{-2 \pm \sqrt{2^2 - 4 \cdot 3 \cdot (-16)}}{2 \cdot 3} =$$

$$= \frac{-2 \pm \sqrt{196}}{6} = \frac{-2 \pm 14}{6}$$

$$x_1 = \frac{-2+14}{6} = \frac{12}{6} = 2$$

$$x_2 = \frac{-2-14}{6} = \frac{-16}{6} = -\frac{8}{3} (= -2\frac{2}{3})$$

in II) oder I)

$$y_1 = -\frac{2}{3} \cdot 2 + \frac{4}{3} = 0$$

$$y_2 = -\frac{2}{3} \cdot \left(-\frac{8}{3}\right) + \frac{4}{3} = \frac{16}{9} + \frac{4}{3} = \frac{16}{9} + \frac{12}{9} = \frac{28}{9} (= 3\frac{1}{9})$$

$$S_1(2|0) \quad S_2\left(-\frac{8}{3} \mid 3\frac{1}{9}\right)$$

b) p: $y = -0,5x^2 + 2x + 4$

g: $y = 0,2x - 1$

I) $-0,5x^2 + 2x + 4 = 0$

II) $0,2x - 1 = 0$

I) = II) $-0,5x^2 + 2x + 4 = 0,2x - 1 \quad | -0,2x$

$$-0,5x^2 + 1,8x + 4 \quad | +1$$

$$-0,5x^2 + 1,8x + 5$$

$$x_{1/2} = \frac{-1,8 \pm \sqrt{1,8^2 - 4 \cdot (-0,5) \cdot 5}}{2 \cdot (-0,5)} =$$

$$= \frac{-1,8 \pm \sqrt{13,24}}{-1}$$

$$x_1 = -(-1,8 + \sqrt{13,24}) = -1,838 \approx -1,84$$

$$x_2 = -(-1,8 - \sqrt{13,24}) = 5,43868 \approx 5,44$$

in II) oder I)

$$y_1 = 0,2 \cdot (-1,84) - 1 = -1,368$$

$$y_2 = 0,2 \cdot (5,44) - 1 = 0,088$$

$$S_1(-1,84 \mid -1,368) \quad S_2(5,44 \mid 0,088)$$

b)

S. 180/8

a) $p_1: y = x^2 - 4x + 2$

$p_2: y = -x^2 - 4x + 2$

I) $x^2 - 4x + 2 = 0$

II) $-x^2 - 4x + 2 = 0$

I) = II) $x^2 - 4x + 2 = -x^2 - 4x + 2$ $| +x^2$

$2x^2 - 4x + 2 = -4x + 2$ $| +4x$

$2x^2 + 2 = 2$ $| -2$

$2x^2 = 0$

$\Rightarrow x = 0 \Rightarrow \text{Berührungspunkt}$

mit Diskriminante D :

$D = 0 - 4 \cdot 2 \cdot 0 = 0$

$\Rightarrow$ Berührungspunkt

In I) oder II)

$y = -0 - 4 \cdot 0 + 2 = 2$

$\Rightarrow S(0|2)$

b) $p_1: y = 0,25x^2$

$p_2: y = 0,5(x-3)^2 + 2,25$

I) $0,25x^2 = 0$

II) $0,5(x-3)^2 + 2,25 = 0$

I) = II)

$0,25x^2 = 0,5(x-3)^2 + 2,25$

$0,25x^2 = 0,5(x^2 - 6x + 9) + 2,25$

$0,25x^2 = 0,5x^2 - 3x + 4,5 + 2,25$

$0,25x^2 = 0,5x^2 - 3x + 6,75$ $| -0,25x^2$

$0 = 0,25x^2 - 3x + 6,75$

$D = (-3)^2 - 4 \cdot (0,25) \cdot 6,75 = 9 - 6,75 = 2,25 > 0$

$x_{1/2} = \frac{+3 \pm \sqrt{(2,25)}}{2 \cdot 0,25} = \frac{3 \pm 1,5}{0,5}$

$\Rightarrow$ Schnittpunkte

S.

a)

b)

$$x_1 = \frac{3+1,5}{0,5} = 9$$

$$x_2 = \frac{3-1,5}{0,5} = 3$$

in I) oder II)

$$y_1 = 0,25(9)^2 = 20,25$$

$$y_2 = 0,25(3)^2 = 2,25$$

$$S_1(9|20,25) \quad S_2(3|2,25)$$

c) $p_1: y = x^2 - 6x + 5$

$p_2: y = -x^2 + 4x + 5$

I) $x^2 - 6x + 5 = 0$

II) $-x^2 + 4x + 5 = 0$

$$\begin{array}{rcl} \text{I} = \text{II} & x^2 - 6x + 5 = -x^2 + 4x + 5 & | -5 \\ & x^2 - 6x = -x^2 + 4x & | +x^2 \\ & 2x^2 - 6x = +4x & | -4x \\ & 2x^2 - 10x = 10 & \end{array}$$

$$D = (-10)^2 - 4 \cdot 2 \cdot 0 = 100 > 0$$

$\Rightarrow$ Schnittpunkte

$$x_{1/2} = \frac{+10 \pm \sqrt{100}}{2 \cdot 2} = \frac{10 \pm 10}{4}$$

$$x_1 = \frac{10-10}{4} = 0$$

$$x_2 = \frac{10+10}{4} = 5$$

in I) oder II)

$$y_1 = 0^2 - 6 \cdot 0 + 5 = 5$$

$$y_2 = 5^2 - 6 \cdot 5 + 5 = 25 - 30 + 5 = 0$$

$$S_1(0|5) \quad S_2(5|0)$$

d) $p_1: y = x^2 - 6x + 8$

$p_2: y = -(x-5)^2 + 1$

I) $x^2 - 6x + 8$

II) $-(x-5)^2 + 1$

I) = II): $x^2 - 6x + 8 = -(x-5)^2 + 1$

$$x^2 - 6x + 8 = -(x^2 - 10x + 25) + 1$$

$$x^2 - 6x + 8 = -x^2 + 10x - 25 + 1$$

$$x^2 - 6x + 8 = -x^2 + 10x - 24 \quad | +x^2$$

$$2x^2 - 6x + 8 = 10x - 24 \quad | -10x$$

$$2x^2 - 16x + 8 = -24 \quad | +24$$

$$2x^2 - 16x + 32$$

$$D = (-16)^2 - 4 \cdot 2 \cdot 32 = 256 - 256 = 0$$

$\Rightarrow$ Beitragspunkt

$$x = \frac{-(-16) \pm 0}{2 \cdot 2} = 4$$

in $\mathbb{I}$ oder $\mathbb{I}$

$$y = -(4-5)^2 + 1 = -1 + 1 = 0$$

$\Rightarrow$ S(4|0)

S.

a)

b)