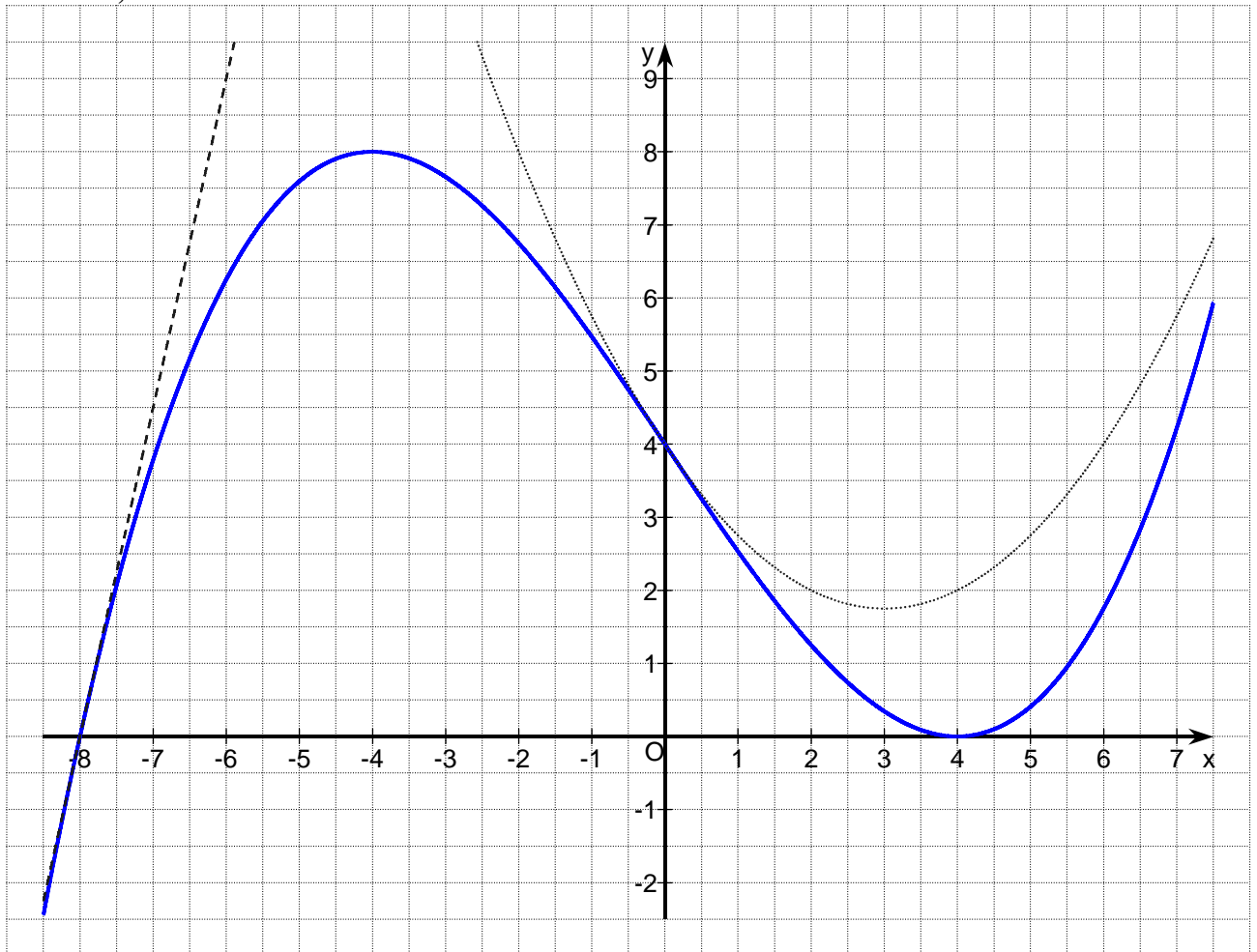


Klasse BVKT1
2. Schulaufgabe aus der Mathematik
am 09.05.2011

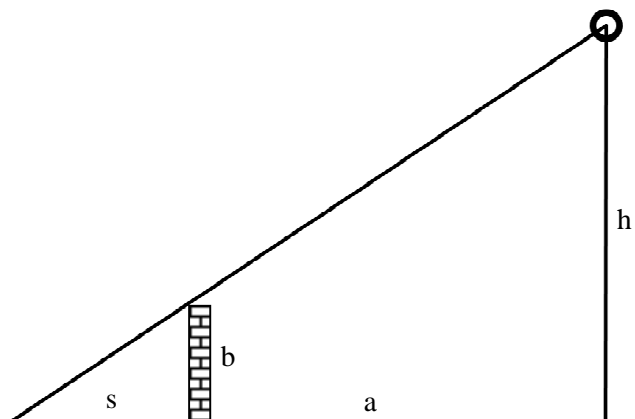
Name:

1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	4.1	Σ

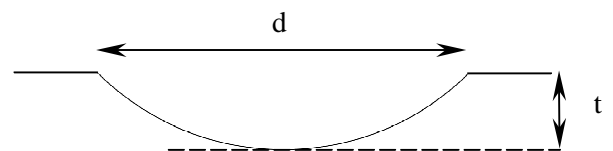
Zu 1.2, 2.1 und 2.2



Aufgabe 3



Aufgabe 4



BVKT1 2. Schulaufgabe am 0.5.2011

1.1
 (6)
$$\begin{array}{cccc|ccc} 16 & -4 & 1 & 14 & \cdot & 60 & -30 & 60 \\ 4 & 2 & 1 & 2 & \cdot & 60 & 30 & -30 \\ 36 & 6 & 1 & 4 & \cdot & 120a & -30 & \Leftrightarrow a = \frac{1}{4} \end{array}$$

$$20 \cdot \frac{1}{4} + 10b = -10 \Leftrightarrow 10b = -15 \Leftrightarrow b = -1.5 = -\frac{3}{2}$$

$$4 \cdot \frac{1}{4} + 2 \cdot (-1.5) + c = 2 \Leftrightarrow c = 4 ; p(x) = \frac{1}{4}x^2 - \frac{3}{2}x + 4$$

1.2
 (4)
$$x_s = -\frac{b}{2a} = -\frac{-1.5}{2 \cdot 0.25} = 3 ; y_s = p(3) = \frac{1}{4} \cdot 9 - \frac{9}{2} + 4 = 1.75$$

$$\Rightarrow S(3|1.75)$$

1.3
 (2) Nach unten offene, gestauchte Parabeln durch $S_1(0|1)$

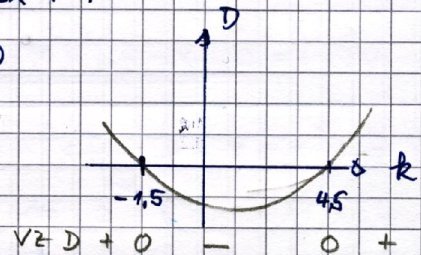
1.4
 (7)
$$\frac{1}{4}x^2 - \frac{3}{2}x + 4 = -\frac{1}{2}x^2 - kx + 1$$

$$\Leftrightarrow \frac{3}{4}x^2 + (k - \frac{3}{2})x + 3 = 0$$

$$D = (k - \frac{3}{2})^2 - 4 \cdot \frac{3}{4} \cdot 3$$

$$= k^2 - 3k + \frac{9}{4} - 9$$

$$k^2 - 3k - \frac{27}{4} = 0$$



$$k_{1/2} = \frac{3 \pm \sqrt{9 + 4 \cdot \frac{27}{4}}}{2} ; k_1 = \frac{3 + \sqrt{36}}{2} = 4.5 ; k_2 = -1.5$$

Aufg 1: (19)

Zwei Schnittpunkte für $k \in \mathbb{R} \setminus [-1.5; 4.5]$

2.0
$$p(x) = \frac{1}{32}x^3 - \frac{3}{2}x + 4 ; x_0 = 4$$

2.1
 (8)
$$g(x) = \frac{1}{32}(x^3 - 48x + 128)$$

$$(x^3 - 48x + 128) : (x - 4) = x^2 + 4x - 32 \dots$$

$$= (x - 4)(x + 8)$$

$$\begin{array}{r} (x^3 - 48x + 128) \\ - (x^3 - 4x^2) \\ \hline 4x^2 - 48x \\ - (4x^2 - 16x) \\ \hline -32x + 128 \\ - (-32x + 128) \\ \hline \end{array}$$

$$x_0 = 4 \quad \text{do. NST}$$

$$x_2 = -8 \quad \text{enf. NST}$$

Graph G_g ..

2. Schulaufgabe am 9.5.2011

2.2 $x_1 = -8$; $(x+8)^2 = x^2 + 16x + 64$ (8)

$$\frac{1}{32}(x^3 - 48x + 128) = mx + t$$

$$\Leftrightarrow x^3 - 48x - 32mx + 128 - 32t = 0$$

$$(x^3 - 48x - 32mx + 128 - 32t) : (x^2 + 16x + 64) = x - 16 : \\ - (x^3 + 16x^2 + 64x)$$

$$-16x^2 - 112x - 32mx + 128 - 32t$$

$$- (-16x^2 - 256x - 1024)$$

$$144x - 32mx + 1152 - 32t$$

$$m = \frac{144}{32} = 4.5 ; t = \frac{1152}{32} = 36$$

$$\Rightarrow t(x) = 4.5x + 36$$

Graph G_t

2.3 $v(x) = a(x-4)(x+8)(x-\beta)(x-c)$ $a, \beta, c \in \mathbb{R}$ (3)
 $a \neq 0$

2.4 $\frac{1}{32}x^3 - \frac{3}{2}x + 4 = \frac{1}{4}x^2 - \frac{3}{2}x + 4 \Leftrightarrow \frac{1}{32}x^3 - \frac{1}{4}x^2 = 0$ (4) Aufg 2.

$$\frac{1}{32}x^2(x-8) = 0 \Rightarrow x_1 = 0 ; S_1(0|4) ; x_2 = 8 ; S_2(8|8)$$
 (23)

3.1 $\frac{h}{a+s} = \frac{b}{s} \Leftrightarrow h = \frac{b}{s} \cdot (a+s) = \frac{7.5}{3} \cdot 9 \Rightarrow h = 4.5$ (3)

3.2 Neue Schattenlänge s' ; $\Delta s = s' - s$

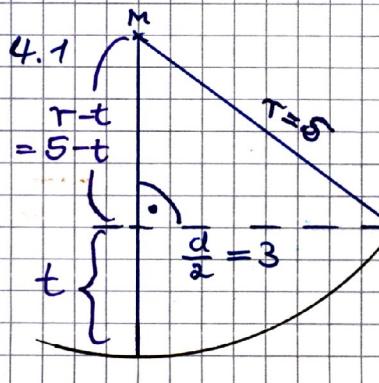
$$\frac{s'}{b} = \frac{s'+a}{h} \Leftrightarrow h s' = b s' + a b \Leftrightarrow s' = \frac{a b}{h - b}$$
 (4)

$$s' = \frac{9 \cdot 7.5}{4.5 - 7.5} = 4.5 ; \text{Der Schatten w\u00e4re } 4.5 - 3 = 1.5 \text{ [m]}$$

l\u00e4nger

Aufg 3

(7)

4.1  $r^2 = (r-t)^2 + \left(\frac{d}{2}\right)^2$ \dots
 $\Rightarrow 25 = (5-t)^2 + 3^2$
 $\Leftrightarrow 25 = 25 - 10t + t^2 + 9$
 $\Leftrightarrow t^2 - 10t + 9 = 0$
 $\Leftrightarrow (t-9)(t+1) = 0$
 $t_1 = 9 \quad t_2 = 1$

$\Sigma = 56$