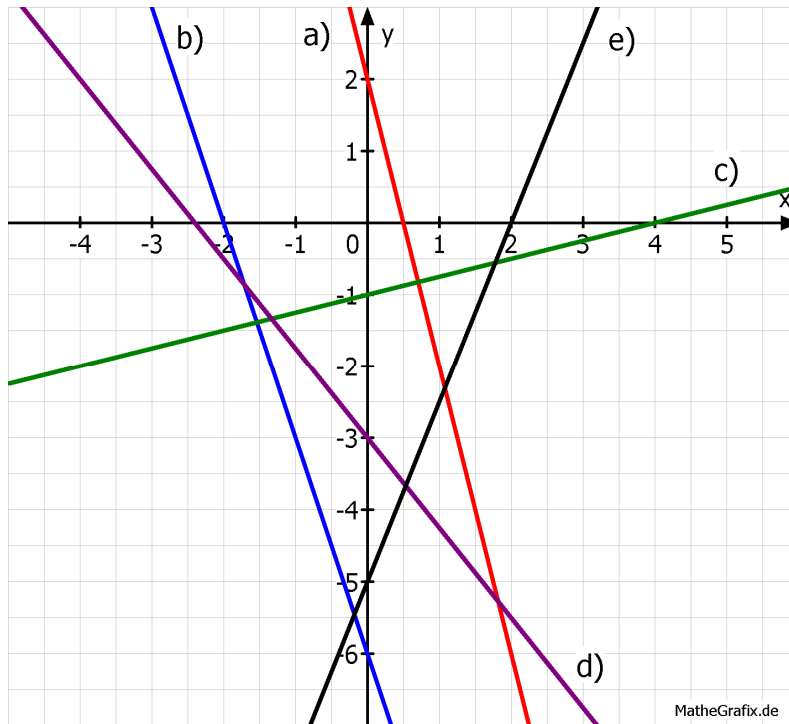


Lösungen – Langfristige HA

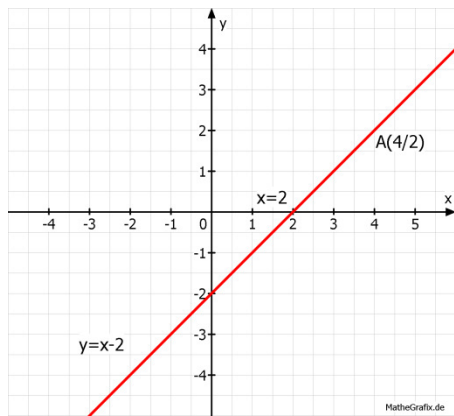
Lineare Funktionen

1.

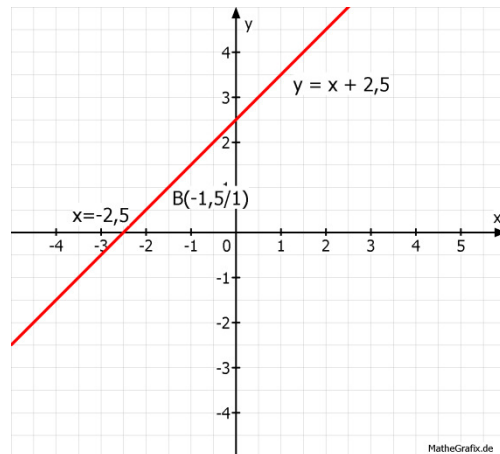


a) $x_0 = 0,5$ b) $x_0 = -2$ c) $x_0 = 4$ d) $x_0 = -2,4$ e) $x_0 = 2$

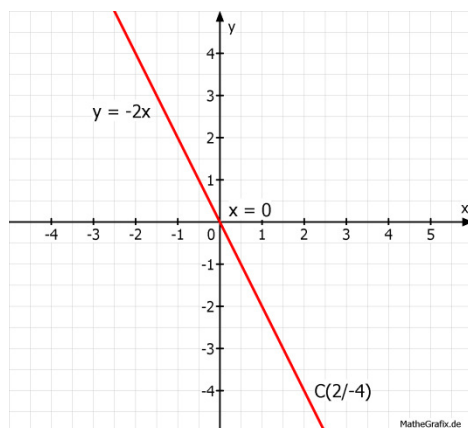
2. a)



b)



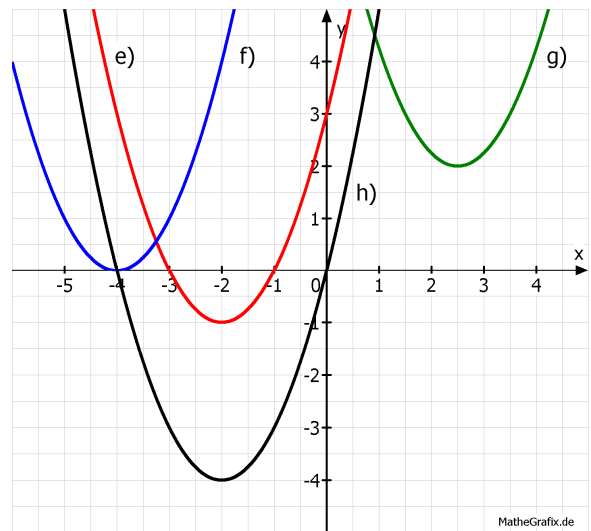
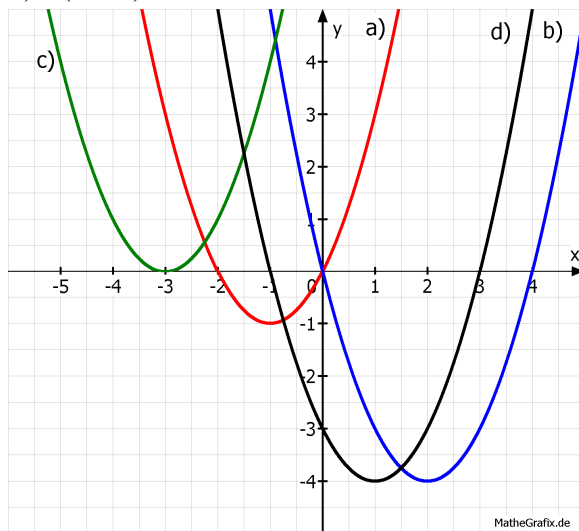
c)



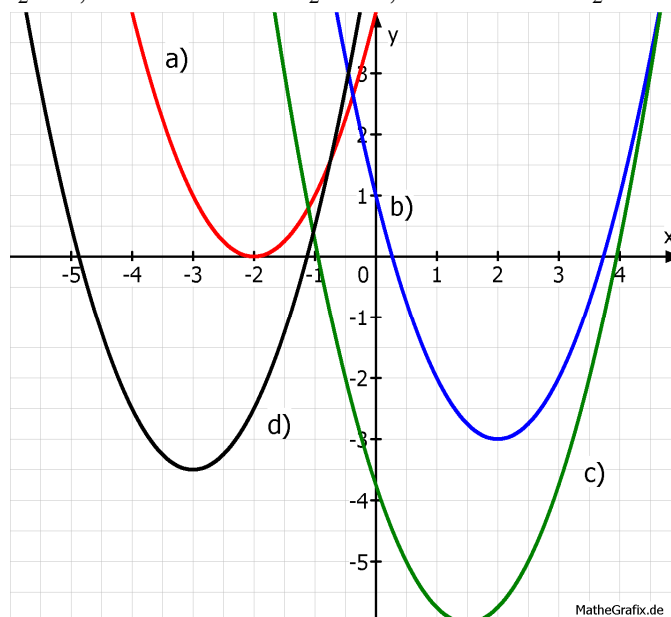
3. $f_1: y = 2x$ $f_2: y = -3x + 2$ $f_3: y = 3$ $f_4: y = \frac{1}{2}x - 1,5$ $f_5: y = -\frac{2}{3}x + 2$

Quadratische Funktionen

1. a) S(-1/-1) b) S(2/-4) c) S(-3/0) d) S(1/-4) e) S(-2/-1) f) S(-4/0) g) S(2,5/2)
h) S(-2/-4)



2. a) S(-2/0)
 $x_{1/2} = -2$
- b) S(2/-3)
 $x_1 = 3,7$
 $x_2 = 0,3$
- c) S(1,5/-6)
 $x_1 = 3,9$
 $x_2 = -0,9$
- d) S(-3/-3,5)
 $x_1 = -1,1$
 $x_2 = -4,9$



a) $y = x^2 + 4x + 4$

$$x_{1/2} = -2 \pm \sqrt{4 - 4}$$

$$x_{1/2} = -2 \pm \sqrt{0}$$

$$x_{1/2} = -2$$

b) $y = x^2 - 4x + 1$

$$x_{1/2} = 2 \pm \sqrt{4 - 1}$$

$$x_{1/2} = 2 \pm \sqrt{3}$$

$$x_1 = 3,7$$

$$x_2 = 0,3$$

c) $y = x^2 - 3x - 3,75$

$$x_{1/2} = 1,5 \pm \sqrt{2,25 + 3,75}$$

$$x_{1/2} = 1,5 \pm \sqrt{6}$$

$$x_1 = 3,9$$

$$x_2 = -0,9$$

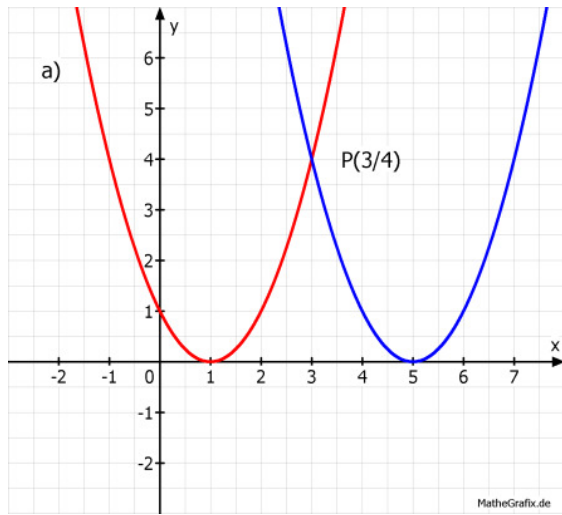
d) $y = x^2 + 6x + 5,5$

$$x_{1/2} = -3 \pm \sqrt{9 - 5,5}$$

$$x_{1/2} = -3 \pm \sqrt{3,5}$$

$$x_1 = -1,1 \quad x_2 = -4,9$$

3.



$$x^2 - 10x + 25 = x^2 - 2x + 1 \quad / -x^2$$

$$-10x + 25 = -2x + 1 \quad / +2x - 25$$

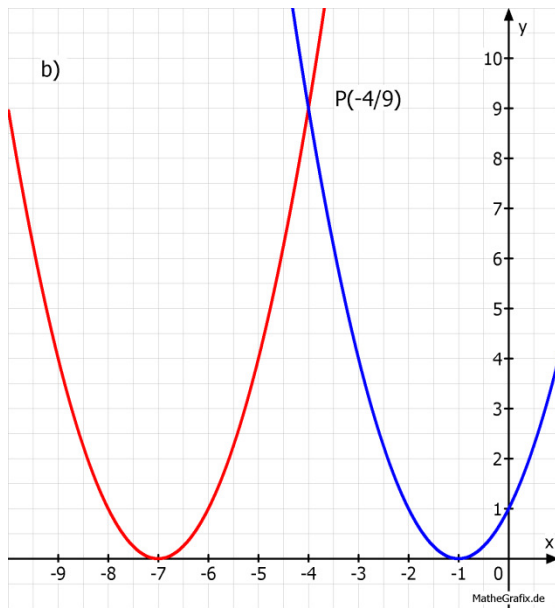
$$-8x = -24 \quad / :(-8)$$

$$x = 3$$

$$y = (x - 5)^2$$

$$y = (3 - 5)^2$$

$$y = 4 \quad P(3/4)$$



$$x^2 + 14x + 49 = x^2 + 2x + 1 \quad / -x^2$$

$$14x + 49 = 2x + 1 \quad / -2x - 49$$

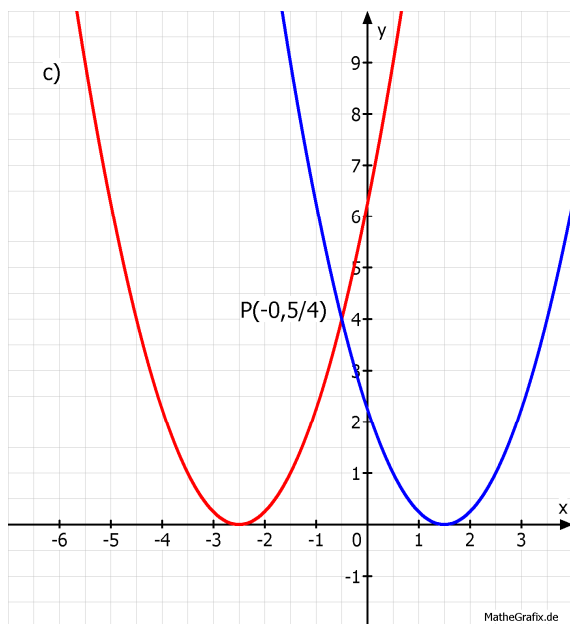
$$12x = -48 \quad / :12$$

$$x = -4$$

$$y = (x+7)^2$$

$$y = (-4 + 7)^2$$

$$y = 9 \quad P(-4/9)$$



$$x^2 + 5x + 6,25 = x^2 - 3x + 2,25 \quad / -x^2$$

$$5x + 6,25 = -3x + 2,25 \quad / +3x - 6,25$$

$$8x = -4 \quad / :8$$

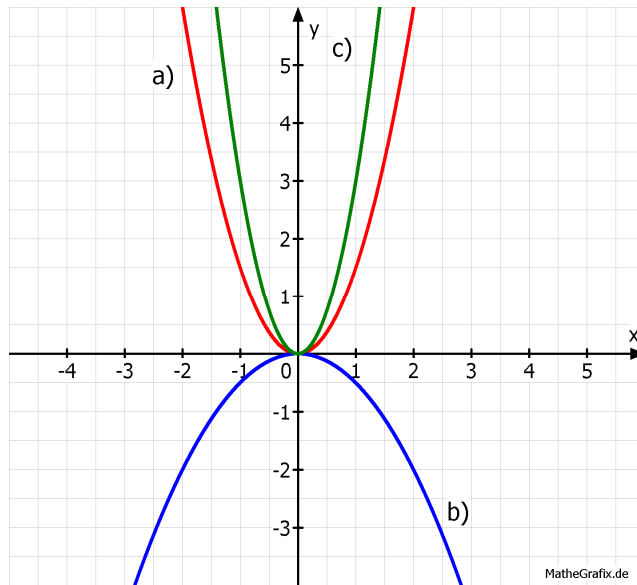
$$x = -0,5$$

$$y = x^2 - 3x + 2,25$$

$$y = 0,25 + 1,5 + 2,25$$

$$y = 4 \quad P(-0,5/4)$$

4.



x	-3	-2	-1	0	1	2	3
y	13,5	6	1,5	0	1,5	6	13,5

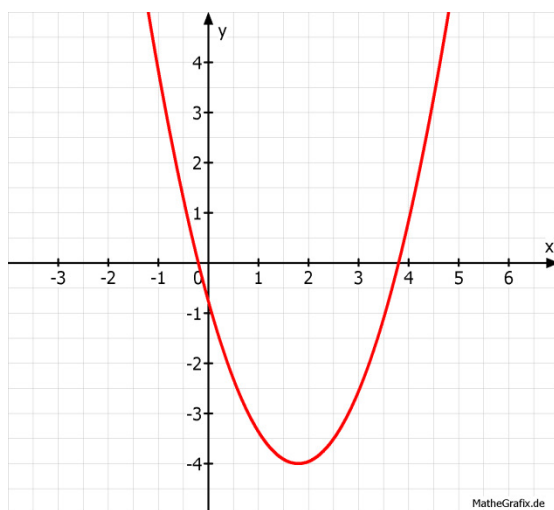
x	-3	-2	-1	0	1	2	3
y	-4,5	-2	-0,5	0	-0,5	-2	-4,5

x	-1,5	-1	-0,5	0	0,5	1	1,5
y	6,75	3	0,75	0	0,75	3	6,75

5. A: $y = \frac{1}{4}x^2$ B: $y = 4x^2$ C: $y = -\frac{1}{4}x^2$ D: $y = -4x^2$

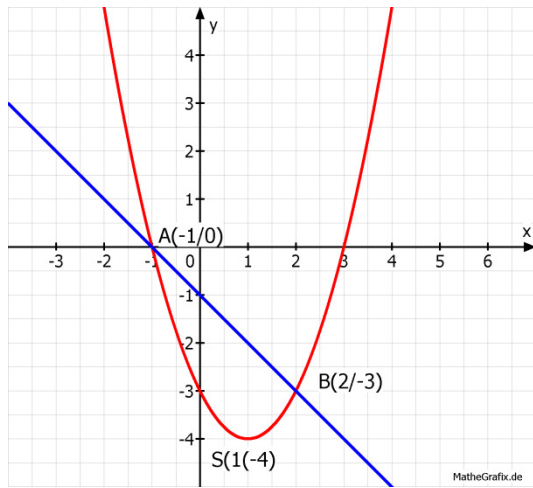
Beispiele für Prüfungsaufgaben

1.



- a) S(1,8/-4)
- b) $y = x^2 - 3,6x - 0,76$
 $0 = x^2 - 3,6x - 0,76$
 $x_{1/2} = 1,8 \pm \sqrt{3,24 + 0,76}$
 $x_{1/2} = 1,8 \pm 2$
 $x_1 = 3,8 \quad x_2 = -0,2$
- c) $q = +3,24$

2.



b) $0 = x^2 - 2x - 3$

$$x_{1/2} = 1 \pm \sqrt{1 + 3}$$

$$x_1 = 3 \quad x_2 = -1$$

c) $y = 2^2 - 2 \cdot 2 - 3$

$$y = -3$$

d) siehe Diagramm

Quadratische Gleichungen

1. a) $x_{1/2} = -4 \pm \sqrt{16 - 7} \quad x_1 = -1 \quad x_2 = -7$

b) $x_{1/2} = -1 \pm \sqrt{1 + 3} \quad x_1 = 1 \quad x_2 = -3$

c) $x_{1/2} = 2,5 \pm \sqrt{6,25 + 24} \quad x_1 = 8 \quad x_2 = -3$

d) $x^2 + 6x - 16 = 0 \quad x_{1/2} = -3 \pm \sqrt{9 + 16} \quad x_1 = 2 \quad x_2 = -8$

e) $x^2 + 2x - 8 = 0 \quad x_{1/2} = -1 \pm \sqrt{1 + 8} \quad x_1 = 2 \quad x_2 = -4$

f) $x^2 - 4x - 5 = 0 \quad x_{1/2} = 2 \pm \sqrt{4 + 5} \quad x_1 = 5 \quad x_2 = -1$

g) $x^2 + 10x - 24 = 0 \quad x_{1/2} = -5 \pm \sqrt{25 + 24} \quad x_1 = 2 \quad x_2 = -12$

2. $2a + 2b = 70$

$$a \cdot b = 286 \rightarrow a = \frac{286}{b}$$

$$\rightarrow 2 \cdot \frac{286}{b} + 2b = 70 \quad / \cdot b$$

$$572 + 2b^2 = 70b$$

$$0 = 2b^2 - 70b + 572 \quad / : 2$$

$$0 = b^2 - 35b + 286$$

$$b_{1/2} = 17,5 \pm \sqrt{306,25 - 286}$$

$$b_1 = 22 \quad b_2 = 13 \quad \text{Die Halle ist 22 m lang und 13 m breit.}$$

3. $a \cdot b = 69000$

$$a + 70 = b \rightarrow a \cdot (a + 70) = 69000$$

$$a^2 + 70a = 69000$$

$$a^2 + 70a - 69000 = 0$$

$$a_{1/2} = -35 \pm \sqrt{1225 + 69000}$$

$$a_1 = 230 \quad a_2 = -300 \quad \text{entfällt}$$

$$b = a + 70$$

$$b = 300$$

Das Grundstück ist 300 m lang und 230 m breit.