Selbsttest quadratische Funktionen

Aufgabe: Bestimmen Sie die Nullstellen und den Scheitelpunkt der Parabel
(jeweils f:$\mathbb{R} \to \mathbb{R}$)

a) $f(x) = x^2 - 9{,}6x + 1{,}9$
b) $f(x) = x^2 + 2x + 1$
c) $f(x) = -8{,}7x^2 + 8{,}7x - 9{,}4$
d) $f(x) = 9{,}3x^2 - 8{,}4x + 7{,}4$
e) $f(x) = 1{,}1x^2 - 9{,}1x - 2{,}1$
f) $f(x) = x^2 - 6{,}4x + 8{,}3$
g) $f(x) = x^2 + 9{,}3x + 4{,}8$
h) $f(x) = x^2 - 9{,}7x - 1$
i) $f(x) = 6x^2 - 8{,}4x - 3{,}5$
j) $f(x) = 1{,}7x^2 + 6{,}9x + 3{,}4$
k) $f(x) = x^2 + 9{,}8x + 4{,}3$
l) $f(x) = -6{,}8x^2 - 0{,}2x - 0{,}9$
m) $f(x) = x^2 + 5x - 6{,}8$
n) $f(x) = 5{,}8x^2 - 0{,}6x - 5{,}6$
o) $f(x) = -0{,}5x^2 + 1{,}2x + 4{,}2$
p) $f(x) = -9{,}8x^2 - 0{,}6x - 7{,}9$
q) $f(x) = -2{,}9x^2 - 4{,}7x - 4{,}9$
r) $f(x) = x^2 - 3{,}7x + 3{,}5$
s) $f(x) = 7{,}3x^2 + 2{,}1x + 4{,}4$
t) $f(x) = x^2 + 0{,}2x + 4{,}6$

u) $y = f(x) = -x^2 + 64$
v) $y = f(x) = x^2 + 4x - 21$
w) $y = f(x) = x^2 - 16x + 60$
x) $y = f(x) = -2x^2 + 10x - 12$
y) $y = f(x) = -4x^2 - 76x - 360$
z) $y = f(x) = x^2 + x - 72$
aa) $y = f(x) = x^2 - 10x + 21$
ab) $y = f(x) = -4x^2 - 20x + 24$
ac) $y = f(x) = x^2 + 4x + 3$
ad) $y = f(x) = 8x^2 - 128x + 504$
ae) $y = f(x) = -3x^2 + 45x - 162$
af) $y = f(x) = -8x^2 - 32x + 40$
ag) $y = f(x) = -6x^2 - 6x + 36$
ah) $y = f(x) = x^2 - 5x - 6$
ai) $y = f(x) = -7x^2 - 21x + 378$
aj) $y = f(x) = x^2 - 12x + 32$
ak) $y = f(x) = x^2 + x - 56$
al) $y = f(x) = -8x^2 + 80x - 168$
am) $y = f(x) = x^2 - 11x + 24$
an) $y = f(x) = x^2 + 5x - 36$

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Lösungen:

a) $f(x) = x^2 - 9,6x + 1,9$ L: $x_1 = 9,3978$; $x_2 = 0,2022$; $y_s = 1,9$ S = (4,8; -21,14);

b) $f(x) = x^2 + 2x + 1$ L: Keine Nullstellen $y_s = 1$ S = (-1; 0);

c) $f(x) = -8,7x^2 + 8,7x - 9,4$ L: Keine Nullstellen $y_s = -9,4$ S = (0,5; -7,225);

d) $f(x) = 9,3x^2 - 8,4x + 7,4$ L: Keine Nullstellen $y_s = 7,4$ S = (0,4516; 5,5032);

e) $f(x) = 1,1x^2 - 9,1x - 2,1$ L: $x_1 = 8,4974$; $x_2 = -0,2247$; $y_s = -2,1$ S = (4,1364; -20,9205);

f) $f(x) = x^2 - 6,4x + 8,3$ L: $x_1 = 4,5928$; $x_2 = 1,8072$; $y_s = 8,3$ S = (3,2; -1,94);

g) $f(x) = x^2 + 9,3x + 4,8$ L: $x_1 = -0,5485$; $x_2 = -8,7515$; $y_s = 4,8$ S = (-4,65; -16,8225);

h) $f(x) = x^2 - 9,7x - 1$ L: $x_1 = 9,802$; $x_2 = -0,102$; $y_s = -1$ S = (4,85; -24,5225);

i) $f(x) = 6x^2 - 8,4x - 3,5$ L: $x_1 = 1,736$; $x_2 = -0,336$; $y_s = -3,5$ S = (0,7; -6,44);

j) $f(x) = 1,7x^2 + 6,9x + 3,4$ L: $x_1 = -0,5739$; $x_2 = -3,4849$; $y_s = 3,4$ S = (-2,0294; -3,6015);

k) $f(x) = x^2 + 9,8x + 4,3$ L: $x_1 = -0,4604$; $x_2 = -9,3396$; $y_s = 4,3$ S = (-4,9; -19,71);

l) $f(x) = -6,8x^2 - 0,2x - 0,9$ L: Keine Nullstellen $y_s = -0,9$ S = (-0,0147; 0,9044);

m) $f(x) = x^2 + 5x - 6,8$ L: $x_1 = 1,1125$; $x_2 = -6,1125$; $y_s = -6,8$ S = (-2,5; -13,05);

n) $f(x) = 5,8x^2 - 0,6x - 5,6$ L: $x_1 = 1,0357$; $x_2 = -0,9322$; $y_s = -5,6$ S = (0,0517; -5,6155);

o) $f(x) = -0,5x^2 + 1,2x + 4,2$ L: $x_1 = 4,3369$; $x_2 = -1,9369$; $y_s = 4,2$ S = (1,2; 4,92);

p) $f(x) = -9,8x^2 - 0,6x - 7,9$ L: Keine Nullstellen $y_s = -7,9$ S = (-0,0306; -7,8908);

q) $f(x) = -2,9x^2 - 4,7x - 4,9$ L: Keine Nullstellen $y_s = -4,9$ S = (-0,8103; -2,9957);

r) $f(x) = x^2 - 3,7x + 3,5$ L: Keine Nullstellen $y_s = 3,5$ S = (1,85; 0,0775);

s) $f(x) = 7,3x^2 + 2,1x + 4,4$ L: Keine Nullstellen $y_s = 4,4$ S = (-0,1438; 4,249);

t) $f(x) = x^2 + 0,2x + 4,6$ L: Keine Nullstellen $y_s = 4,6$ S = (-0,1; 4,59);

u) $y = f(x) = -x^2 + 64$ L: $x_1 = 8$; $x_2 = -8$; $y_s = 64$ S = (0; 64);

v) $y = f(x) = x^2 + 4x - 21$ L: $x_1 = -7$; $x_2 = 3$; $y_s = -21$ S = (-2; -25);

w) $y = f(x) = x^2 - 16x + 60$ L: $x_1 = 6$; $x_2 = 10$; $y_s = 60$ S = (8; -4);

x) $y = f(x) = -2x^2 + 10x - 12$ L: $x_1 = 3$; $x_2 = 2$; $y_s = -12$ S = (2,5; 0,5);

y) $y = f(x) = -4x^2 - 76x - 360$ L: $x_1 = -10$; $x_2 = -9$; $y_s = -360$ S = (-9,5; 1);

z) $y = f(x) = x^2 + x - 72$ L: $x_1 = -9$; $x_2 = 8$; $y_s = -72$ S = (-0,5; -72,25);

aa) $y = f(x) = x^2 - 10x + 21$ L: $x_1 = 7$; $x_2 = 3$; $y_s = 21$ S = (5; -4);

ab) $y = f(x) = -4x^2 - 20x + 24$ L: $x_1 = -6$; $x_2 = 1$; $y_s = 24$ S = (-2,5; 49);

ac) $y = f(x) = x^2 + 4x + 3$ L: $x_1 = -1$; $x_2 = -3$; $y_s = 3$ S = (-2; -1);

ad) $y = f(x) = 8x^2 - 128x + 504$ L: $x_1 = 7$; $x_2 = 9$; $y_s = 504$ S = (8; -8);

ae) $y = f(x) = -3x^2 + 45x - 162$ L: $x_1 = 6$; $x_2 = 9$; $y_s = -162$ S = (7,5; 6,75);

af) $y = f(x) = -8x^2 - 32x + 40$ L: $x_1 = 1$; $x_2 = -5$; $y_s = 40$ S = (-2; 72);

ag) $y = f(x) = -6x^2 - 6x + 36$ L: $x_1 = 2$; $x_2 = -3$; $y_s = 36$ S = (-0,5; 37,5);

ah) $y = f(x) = x^2 - 5x - 6$ L: $x_1 = 6$; $x_2 = -1$; $y_s = -6$ S = (2,5; -12,25);

ai) $y = f(x) = -7x^2 - 21x + 378$ L: $x_1 = -9$; $x_2 = 6$; $y_s = 378$ S = (-1,5; 393,75);

aj) $y = f(x) = x^2 - 12x + 32$ L: $x_1 = 4$; $x_2 = 8$; $y_s = 32$ S = (6; -4);

ak) $y = f(x) = x^2 + x - 56$ L: $x_1 = 7$; $x_2 = -8$; $y_s = -56$ S = (-0,5; -56,25);

al) $y = f(x) = -8x^2 + 80x - 168$ L: $x_1 = 3$; $x_2 = 7$; $y_s = -168$ S = (5; 32);

am) $y = f(x) = x^2 - 11x + 24$ L: $x_1 = 8$; $x_2 = 3$; $y_s = 24$ S = (5,5; -6,25);

an) $y = f(x) = x^2 + 5x - 36$ L: $x_1 = 4$; $x_2 = -9$; $y_s = -36$ S = (-2,5; -42,25);