Quadratische Funktionen

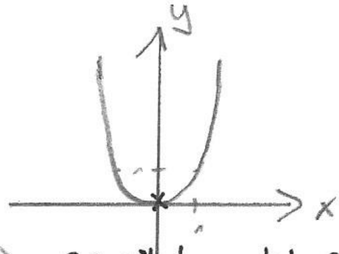
$f(x) = ax^2 + bx + c$

$a, b, c \in \mathbb{R}$
Koeffizienten
allg. Form einer quadr. Parabel

$f(x) = x^2$

$(a = 1,\ b = c = 0)$

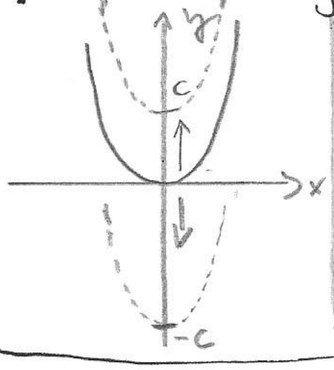
Normalparabel



Scheitelpunkt $S(0|0)$

Achsenparallele Verschiebungen $(c>0)$

↳ in Richtung der y-Achse



$g(x) = x^2 + c$ $\quad S(0|c)$

$f(x) = x^2$

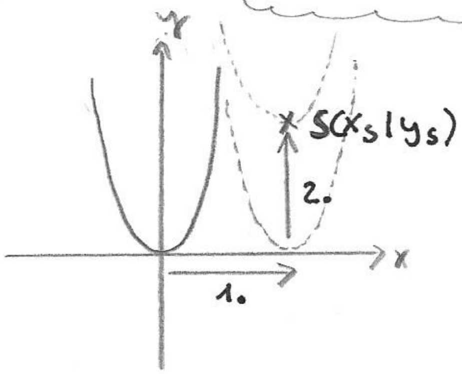
$h(x) = x^2 - c$ $\quad S(0|-c)$

↳ in Richtung der x-Achse

$g(x) = (x+c)^2 \longleftarrow f(x) = x^2 \longrightarrow h(x) = (x-c)^2$

$S(-c|0)$ $\qquad S(c|0)$

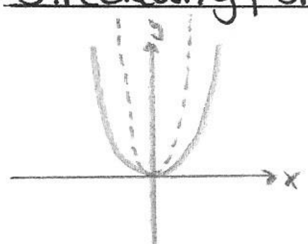
↳ in beide Richtungen



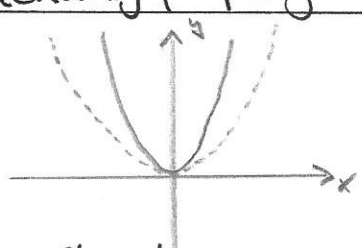
$f(x) = x^2 \xrightarrow{1.} g(x) = (x - x_s)^2$

$g(x) = (x - x_s)^2 \xrightarrow{2.} h(x) = g(x) + y_s = (x - x_s)^2 + y_s$

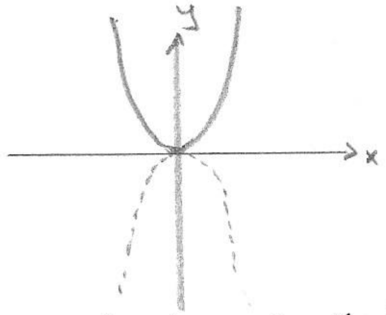
Streckung, Stauchung, Spiegelung



Streckung:
$f(x) = a \cdot x^2$
$a > 1$



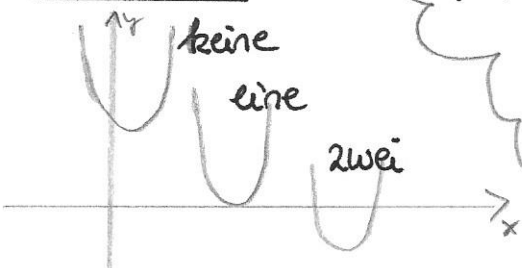
Stauchung:
$f(x) = a \cdot x^2$
$0 < a < 1$



Spiegelung an x-A.
$f(x) = a \cdot x^2$
$a < 0$

Allg. Scheitelpunktsform: $f(x) = a \cdot (x - x_s)^2 + y_s$

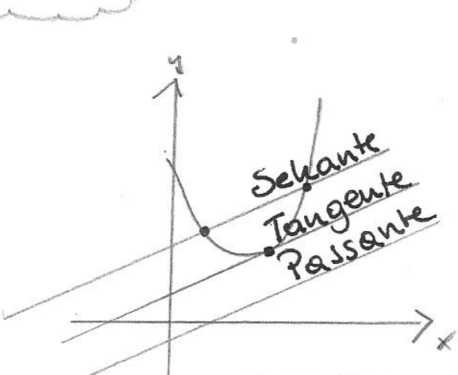
Nullstellen



pq-Formel

$x^2 + px + q = 0$

$x_{1/2} = -\frac{p}{2} \pm \sqrt{\frac{p^2}{4} - q}$



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