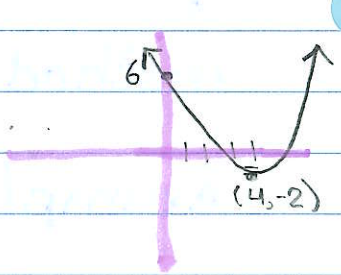
Sketching Quadratic Functions

Vertex form: $y = a(x-h)^2 + q$

example: $y = \frac{1}{2}(x+4)^2 - 2$ (change sign) vertex: $(+4, -2)$

find y-intercept: $(x=0)$ $y = \frac{1}{2}(0-4)^2 - 2 = 6$



General form: $y = ax^2 + bx + c$

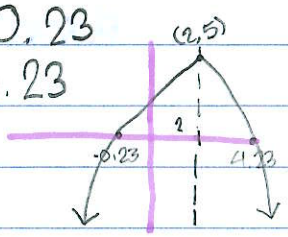
example: $y = -x^2 + 4x + 1$

use: $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \rightarrow x = \frac{-4 \pm \sqrt{(4^2) - 4(-1)(1)}}{2(-1)}$

$x = -0.23$

$x = 4.23$

$\frac{-0.23 + 4.23}{2} = 2$ $f(2) = -(2)^2 + 4(2) + 1 = 5$



Factored Form: $y = a(x-r_1)(x-r_2)$

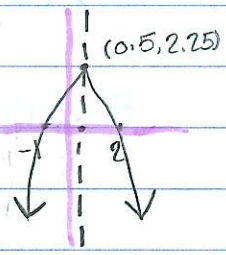
$y = -1(x-2)(x+1)$

$x-2=0$ $x+1=0$ $\frac{2+(-1)}{2}$

$+2+2$ $-1-1$ $= 0.5$

$x=2$ $x=-1$

$f(0.5) = -1(0.5-2)(0.5+1) = 2.25$



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