3,3,25

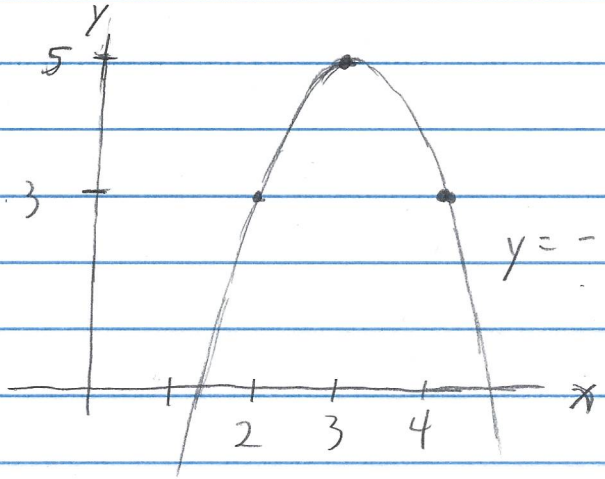
Exercise 3.3.25 Consider $f(x) = -2(x-3)^2 + 5$.
(a) Find the vertex and axis of symmetry.
(b) Determine whether the graph is concave up or concave down. (c) Graph.

Solution

(a) By Note 3.3.A, the quadratic function $f(x) = a(x-h)^2 + k$ has vertex (h, k) and axis of symmetry is $x = h$. Here, $h = 3$ and $k = 5$, so the vertex is $(h, k) = (3, 5)$ and the axis of symmetry is $x = 3$.

(b) Since $a = -2$, then the graph is concave down.

(c) Notice that $f(2) = -2((2)-3)^2 + 5 = 3$ and $f(4) = -2((4)-3)^2 + 5 = 3$. The graph is



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