4.3.47 Since the vertex is $(-1, 2)$, the function f has a formula of the form

$$f(x) = a(x+1)^2 - 2.$$

Since $(0, -1)$ is on the graph, $f(0) = -1$, so

$$a(0+1)^2 - 2 = -1;$$
$$a - 2 = -1;$$
$$a = 1.$$

Therefore,

$$f(x) = (x+1)^2 - 2 = x^2 + 2x - 1.$$