

$f(x, y) = 8 - 2x + 4y - x^2 - 4y^2 \Rightarrow f_x = -2 - 2x, f_y = 4 - 8y,$
 $f_{xx} = -2, f_{xy} = 0, f_{yy} = -8.$ Then $f_x = 0$ and $f_y = 0$ imply
 $x = -1$ and $y = \frac{1}{2}$, and the only critical point is $(-1, \frac{1}{2})$.

$D(x, y) = f_{xx}f_{yy} - (f_{xy})^2 = (-2)(-8) - 0^2 = 16$, and since
 $D(-1, \frac{1}{2}) = 16 > 0$ and $f_{xx}(-1, \frac{1}{2}) = -2 < 0$, $f(-1, \frac{1}{2}) = 10$ is a local
maximum by the Second Derivatives Test.

