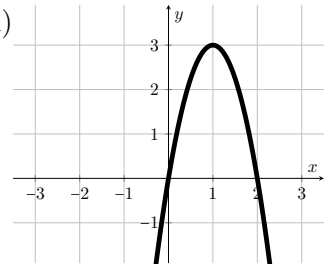
4. [10 points] Below are several quadratic equations, labeled A – J:

A. $y = -3x(x-2)$
B. $y = x(x+2)$
C. $y = x^2 + 1$
D. $y = x^2 - 1$
E. $y = 3x(x+2)$
F. $y = (x-1)(x+1)$
G. $y = -3(x-1)^2 + 3$
H. $y = (x-1)(x+1) + 2$
I. $y = -x(x-2) + 2$
J. $y = (x-1)^2 + 1$

a. [8 points] For each of the graphs below list ALL equations (among A–J) that match the given graph. If no equations match the graph, write NONE.

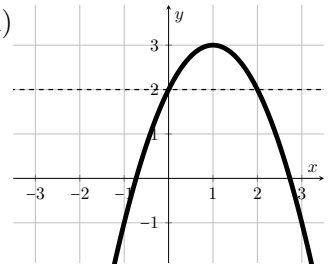
Note that some graphs have dashed lines included, to help you think of those graphs as *shifts* of other quadratic equations.

(i)



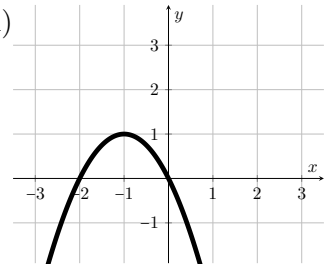
Equation(s): A, G

(iii)



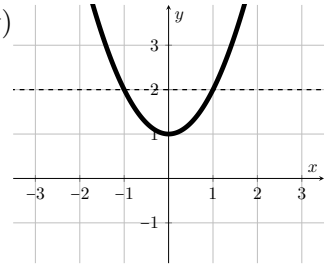
Equation(s): I

(ii)



Equation(s): NONE

(iv)



Equation(s): H, C

b. [2 points] It turns out we can also think of these graphs as transformations of each other. Claudia claims that we can transform the graph of (ii) into the graph of (i) using a vertical stretch followed by horizontal shift. She is right! Find the stretch factor and shift value that will complete that transformation:

Stretch vertically by a factor of: 3

Shift right by: 2