

Three points  $A(1, 3)$ ,  $B(4, 1)$ , and  $C(-2, 1)$  lie on a coordinate plane. Given this information, answer the questions below.

(1): Find the interval of  $b$  such that the line  $y = 2x + b$  intersects segment  $AB$  (including the endpoints).

(2): Find the interval of  $a$  such that the line  $y = ax - 2$  intersects segment  $AC$  (including the endpoints).

