

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).

