Observe that the left of the intersection is $l = \max(a, c)$. Similarly, observe that the right of the intersection is $r = \min(b, d)$.

We have three cases: if $l > r$, the intersection does not exist; if $l = r$, the intersection is a single real number; and if $l < r$, clearly, the intersection is a range. The `eps` variable is a very small float that exists to handle floating-point errors in the inequalities. (4 sentences)