Geometry (H)
Worksheet: Fuzzy Logic

In symbolic logic, a statement is either true or false (consider true to have a value of 1 and false a value of 0). In fuzzy logic, nothing is true or false, but everything is a matter of degree. For example, consider the statement "The sun is shining." In fuzzy logic, this statement may have a value between 0 and 1 and may be constantly changing. For example, if the sun is partially blocked by clouds, the value of this statement may be 0.25. In fuzzy logic, the values of connective statements are found as follows for statements p and q.

- Not p has a value of 1 - p
- p ∧ q has a truth value equal to the lesse of p and q
- p ∨ q has a truth value equal to the greater of p and q
- p → q has a truth value equal to the lesser of 1 and 1 - p + q
- p ↔ q has a truth value equal to 1 - | p - q |, that is, 1 minus the absolute value of p minus q

Suppose the statement "p: The sun is shining" has a truth value of 0.25 and the statement "q: Mary is getting a tan" has a truth value of 0.20. Find the truth value of

a) p  b) ~q

c) p ∧ q  d) p ∨ q

e) p → q  f) p ↔ q