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tool: A centroid assigns a weight or mass to an output value, y_{ij} , based on the membership value m_{ij} . The network output y or $f(\vec{x})$ is given by the weighted sum of centroid values y_{ij} values divided by the sum of centroid values. Equivalently, the network output is the center of mass of the centroid values.

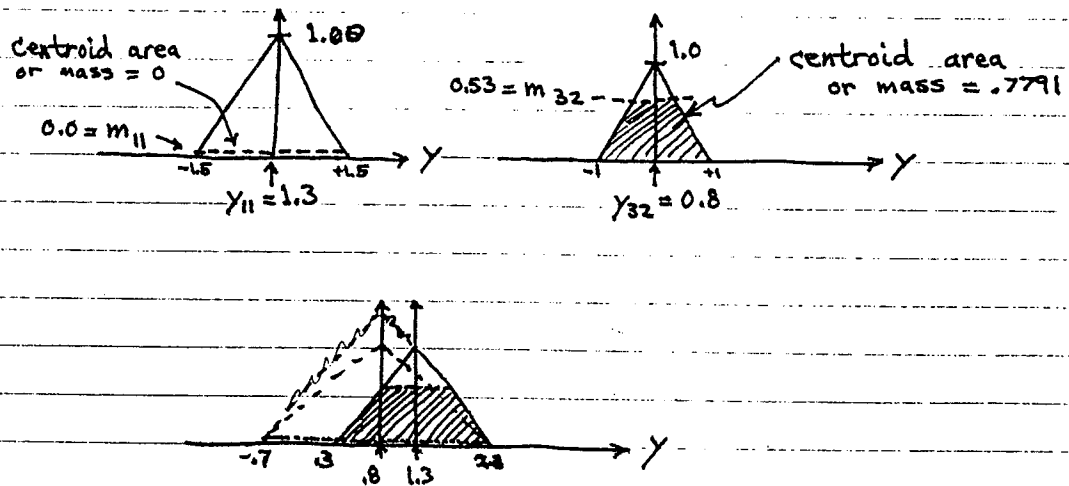
ex: For previous furnace example suppose

$$y_{11} = 1.3 \text{ ft}^3/\text{s} \text{ gas flow}$$

$$y_{32} = 0.8 \text{ ft}^3/\text{s} \text{ " "}$$

Recall that $m_{11} = 0.0$ and $m_{32} = 0.53$.

Define centroids for y_{11} and y_{32} :



The center of mass lies at $y = 1.3$ since the centroid for y_{11} has zero area or mass and y_{32} centroid has nonzero area.

~~tool:~~

tool: The area or mass for a centroid is the area of the centroid below the value of the membership m_{ij} for that y_{ij} .