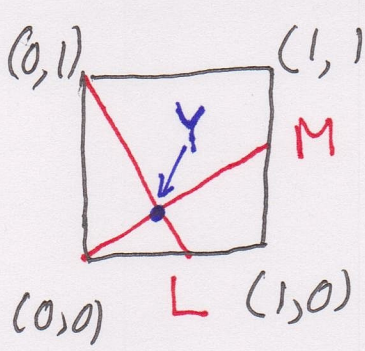
PROBLEM:



Let L be the line joining (0,1) to the midpoint of the line joining (0,0) and (1,0), and let M be the line joining (0,0) to the midpoint of the line joining (1,0) and (1,1). Find the point Y where L meets M.

this is $(\frac{1}{2}, 0)$

this is $(1, \frac{1}{2})$

SOLUTION. We need to find s and t such that

$$(1-s)(0,0) + s\left(1, \tfrac{1}{2}\right) = (1-t)(0,1) + t\left(\tfrac{1}{2}, 0\right).$$

point on M — point on L

Rewrite: $\left(s, \frac{s}{2}\right) = \left(\frac{t}{2}, 1-t\right)$ Now simplify to

$$t = 2s, \quad s = 2(1-t).$$

Solve: $s = 2(1-2s) = 2 - 4s$ $\quad s = \frac{2}{5}$

$t = \frac{4}{5}$

The point is $s\left(1, \frac{1}{2}\right) = \left(\frac{2}{5}, \frac{1}{5}\right)$. ■