Mth-4111 In the figure below, points S, T, U, and V are the midpoints of the sides on which they are located. Use analytical geometry to prove that segments ST and UV are parallel.

$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

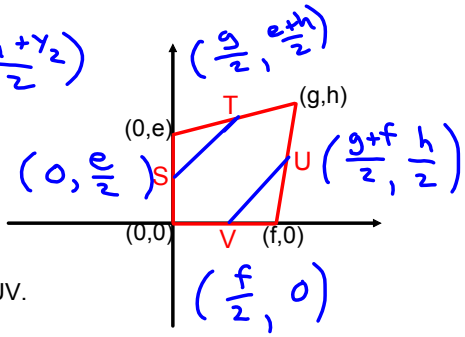
Hypothesis:

S and T are midpoints

U and V are midpoints

Conclusion to prove:

Segment ST is parallel to segment UV.



Statements	Justifications
The coordinates of : (will be given) $S: (0, \frac{e}{2})$ $T: (\frac{g}{2}, \frac{e+h}{2})$ $U: (\frac{g+f}{2}, \frac{h}{2})$ $V: (\frac{f}{2}, 0)$	Midpoint Formula: $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$
$m_{ST} = \frac{\frac{e+h}{2} - \frac{e}{2}}{\frac{g}{2} - 0}$	Slope formula: $m = \frac{y_2-y_1}{x_2-x_1}$
$m_{ST} = \frac{\frac{h}{2}}{\frac{g}{2}}$	
$m_{ST} = \frac{h}{2} \div \frac{g}{2}$	
$m_{ST} = \frac{h}{2} \times \frac{2}{g} = \frac{h}{g}$	
$m_{UV} = \frac{\frac{h}{2} - 0}{\frac{g+f}{2} - \frac{f}{2}}$	
$m_{UV} = \frac{\frac{h}{2}}{\frac{g}{2}}$	
$m_{UV} = \frac{h}{2} \div \frac{g}{2}$	
$m_{UV} = \frac{h}{2} \times \frac{2}{g} = \frac{h}{g}$	
Line ST ∥ Line UV	Since they have the same slope.