Consider the region D in the xy-plane shown below, which is bounded by

$$u = 9 \qquad u = 36 \qquad v = 1 \qquad v = 4$$

where

$$u = xy \qquad v = \frac{y}{x}$$

If you want to determine x and y as functions of u and v, consider uv and u/v.

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- List as many methods as you can think of for finding the area of the given region.
  It is enough to refer to the methods by name or describe them briefly.
- For at least 3 of these methods, give explicitly the formulas you would use to find the area.
  You must put limits on your integrals, but you do not need to evaluate them.
- Using any 2 of these methods, find the area.
  One of these should be a method we have learned recently.
- Now consider the following integral over the same region D:
  $\iint_D \frac{y}{x}\ dA$
- Which of the above methods can you use to do this integral?
- Do the integral.