

Written HW9 – MATH 3503 Fall 2020

**Due by 22 October for timely completion credit**

Find the image of the unit square  $0 \leq u \leq 1$ ,  $0 \leq v \leq 1$  under the specified transformation. Draw pictures and symbolically derive all the pieces.

1. Let  $S$  be the unit square  $0 \leq u \leq 1$  and  $0 \leq v \leq 1$ . Find the image of  $S$  under the transformation

$$\begin{cases} x = 2u - v \\ y = u + 2v \end{cases}$$

2. Let  $S$  be the triangular region with vertices  $(0, 0)$ ,  $(1, 1)$ , and  $(0, 1)$ . Find the image of  $S$  under the transformation

$$\begin{cases} x = u^2 \\ y = v \end{cases}$$