1. (2 pts)

Consider the transformation $T : x = \frac{48}{52}u - \frac{20}{52}v,\ \ y = \frac{20}{52}u + \frac{48}{52}v$

A. Compute the Jacobian:

$\frac{\partial(x,y)}{\partial(u,v)} =$ ______________

B. The transformation is linear, which implies that it transforms lines into lines. Thus, it transforms the square $S : -52 \leq u \leq 52, -52 \leq v \leq 52$ into a square $T(S)$ with vertices:

T(52, 52) = (_________, _________)

T(-52, 52) = (_________, _________)

T(-52, -52) = (_________, _________)

T(52, -52) = (_________, _________)

C. Use the transformation T to evaluate the integral $\iint_{T(S)} x^2 + y^2\ dA$

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2. (2 pts)

Suppose that $\displaystyle\iint_D f(x,y)\ dA = 1$ where D is the disk $x^2 + y^2 \leq 16$. Now suppose E is the disk $x^2 + y^2 \leq 256$ and $g(x,y) = 4f(\frac{x}{4}, \frac{y}{4})$. What is the value of $\displaystyle\iint_E g(x,y)\ dA$?

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