

Change of Variables in Double Integrals

1. Change the variables in the integral

$$\int_D \frac{x - 2y}{3x - y} dA$$

where D is bounded by

$$x - 2y = 0, x - 2y = 4, 3x - y = 1, 3x - y = 8$$

to the variables $u = x - 2y$, $v = 3x - y$, using the following steps:

- (a) Change the equations $u = x - 2y$ and $u = 3x - y$ into equations for x and y .
- (b) Evaluate the Jacobian $\partial(x, y)/\partial(u, v)$.
- (c) Change the boundaries for x and y into boundaries for u and v .
- (d) Write the integral in terms of u and v using the change of variables formula.