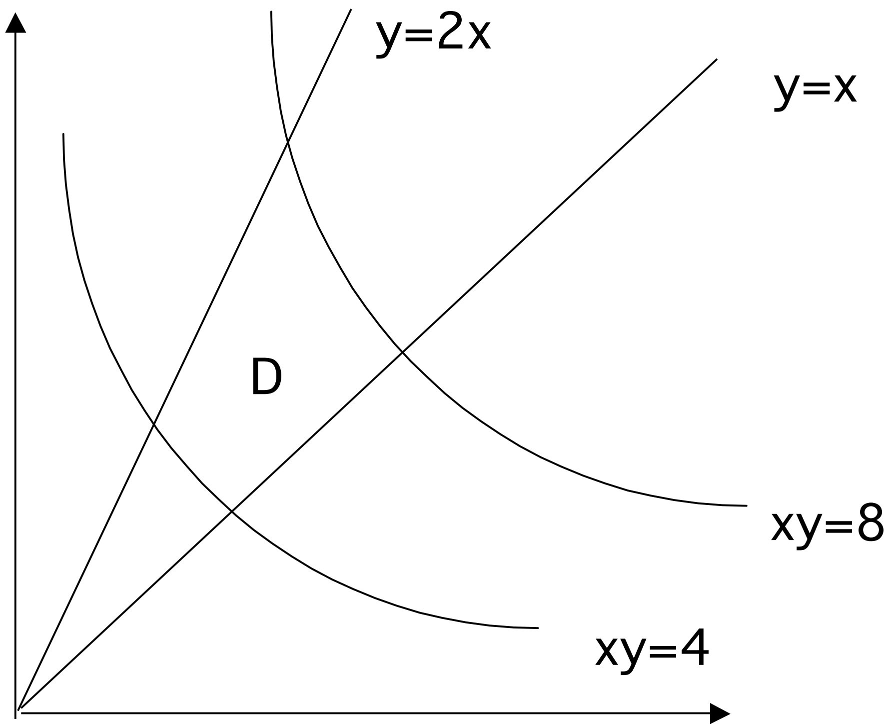
926.b.

$$xy = 4 \ , \ xy = 1 \ , \ y = x \ , \ y = 2x \ , \ x > 1$$



$$A = \iint_D dx\,dy$$

$$\begin{cases} u = xy \\ v = \dfrac{y}{x} \end{cases}$$

$$\frac{d(u,v)}{d(x,y)} = \begin{bmatrix} \dfrac{\partial u}{\partial x} & \dfrac{\partial u}{\partial y} \\ \dfrac{\partial v}{\partial x} & \dfrac{\partial v}{\partial y} \end{bmatrix} = \begin{bmatrix} y & x \\ -\dfrac{y}{x^2} & \dfrac{1}{x} \end{bmatrix}$$

$$dxdy = \left| \det\left(\frac{d(x,y)}{d(u,v)}\right) \right| dudv = \frac{dudv}{\left| \det\left(\frac{d(u,v)}{d(x,y)}\right) \right|} = \frac{dudv}{\left| 2\frac{y}{x} \right|} = \frac{dudv}{| 2v |}$$

$$A = \iint_{D_{uv}} \frac{dudv}{| 2v |}$$

$$D_{uv} = \left\{ (u,v) \ : \ 4 \le u \le 8, \ 1 \le v \le 2 \right\}$$

$$A = \frac{1}{2} \int_{v=1}^{2} \frac{dv}{v} \int_{u=4}^{8} du = \frac{1}{2} (8 - 4) \left[\ln v \right]_{v=1}^{2} = 2 \ln 2 = \ln 4$$

926.h.

$$(a_1x + b_1y + c_1)^2 + (a_2x + b_2y + c_2)^2 = 1$$

$$a_1b_2 - a_2b_1 \neq 0$$

$$A = \iint_D dxdy$$

$$\begin{cases} u = a_1x + b_1y \\ v = a_2x + b_2y \end{cases}$$

$$\frac{d(u,v)}{d(x,y)} = \begin{vmatrix} \frac{\partial u}{\partial x} & \frac{\partial u}{\partial y} \\ \frac{\partial v}{\partial x} & \frac{\partial v}{\partial y} \end{vmatrix} = \begin{vmatrix} a_1 & b_1 \\ a_2 & b_2 \end{vmatrix}$$

$$dxdy = \left| \det\left(\frac{d(x,y)}{d(u,v)}\right) \right| dudv = \frac{dudv}{\left| \det\left(\frac{d(u,v)}{d(x,y)}\right) \right|} = \frac{dudv}{| a_1 b_2 \square a_2 b_1 |}$$

$$A = \square\square_{D_{uv}} \frac{dudv}{| a_1 b_2 \square a_2 b_1 |}$$

$$D_{uv} = \left\{ (u,v) \ : \ (u + c_1)^2 + (v + c_2)^2 \ \square\ 1 \right\}$$

$$A = \frac{\square}{| a_1 b_2 \square a_2 b_1 |}$$