Double Integrals in Polar Coordinates

Question

Consider the double integral formula in Polar coordinates

$$\int_0^{\pi/3} \int_0^{1/\cos(\theta)} r^3 \, dr \, d\theta.$$

Which of the following integral formulas in Cartesian coordinates is this equivalent to?

A. $\displaystyle\int_0^1 \int_0^{x/\sqrt{3}} (x^2+y^2)^{3/2} \, dy \, dx$

B. $\displaystyle\int_0^1 \int_0^{\sqrt{3}\,x} (x^2+y^2)^{3/2} \, dy \, dx$

C. $\displaystyle\int_0^1 \int_0^{x/\sqrt{3}} (x^2+y^2) \, dy \, dx$

D. $\displaystyle\int_0^1 \int_0^{\sqrt{3}\,x} (x^2+y^2) \, dy \, dx$