$$p_x = \frac{n x'}{\sqrt{1 + x'^2 + y'^2}} \quad \text{and} \quad p_y = \frac{n y'}{\sqrt{1 + x'^2 + y'^2}} \,.$$

(1) (2).

Find x' and y'.

From (1),

$$p_x^2 (1 + x'^2 + y'^2) = n^2 x'^2 .$$

Solve for y'^2:

$$y'^2 = \frac{n^2 x'^2 - p_x^2 - p_x^2 x'^2}{p_x^2}$$

$$= \frac{x'^2 (n^2 - p_x^2) - p_x^2}{p_x^2}$$

$$\boxed{y'^2 = x'^2 \left[(n/p_x)^2 - 1 \right] - 1 .} \quad (a)$$

Similarly, $x'^2 = \dfrac{y'^2 (n^2 - p_y^2) - p_y^2}{p_y^2}$ (b)

or simply $\boxed{x'^2 = y'^2 \left[\left(\frac{n}{p_y} \right)^2 - 1 \right] - 1}$

Now substitute (b) into (a) and expand and solve for y'.