$$= -\frac{1}{\lambda^2}(1+\lambda) = \frac{-(1+\lambda)}{\lambda^2}.$$

Putting this value of x in the constraint $x^2 - y^2 = -1$, we get

$$\frac{(1+\lambda)^2}{\lambda^4} - \frac{1}{\lambda^4} = -1$$

or $$\frac{\cancel{1}+\lambda^2+2\lambda-\cancel{1}}{\lambda^4} = -1$$

~~or~~ $$\cancel{\frac{\lambda(\lambda+2)}{\lambda^4 3} = 1}$$

~~or~~ $$\cancel{\frac{\lambda+2}{\lambda^3} = 1}$$

or $$\lambda^4 + \lambda^2 + 2\lambda = 0$$

or $$\lambda(\lambda^3 + \lambda + 2) = 0$$

either $\lambda = 0$ or $(\lambda^3 + \lambda + 2) = 0$

or $\lambda^3 + \lambda + 2 = 0$ — (iii)

(-1) is a root of the eqn (iii).

or $\lambda^3 + \lambda^2 - \lambda^2 - \lambda + 2\lambda + 2 = 0$

or $\lambda^2(\lambda+1) - \lambda(\lambda+1) + 2(\lambda+1) = 0$

or $(\lambda+1)(\lambda^2 - \lambda + 2) = 0$ → This equation has complex roots.

or $(\lambda+1)\,\cancel{(\lambda^2 - 2\lambda + \lambda}$

So, $\lambda = -1$.

For $\lambda = -1$, $y = 1/\lambda^2 = 1$

$x = -\frac{(1+\lambda)}{\lambda^2} = 0$