3rd Exercise:

1) Since [CA) & [CB) are two tangents to (C) issued from C. (given)

So, CA = CB (tangent theorem: pt from which tangents are drawn to circle is equidistant from pts of tangencies).

2) Statement-1: [CA) & [CB) are tangents to (C) at A & B (given)

So, CA = CB

then, $2x+y = x+2y-1$

$\boxed{x-y=-1}$

Statement-2:

The perimeter of quadrilateral CAOB is 14cm

So, $CA+AO+OB+CB = 14cm$

$2x+y+2(x+y)+x+2y-1 = 14$

$(5x+5y=15) \times \left(\frac{1}{5}\right)$

$\boxed{x+y=3}$

Thus, the given system is a modeling of the above statements.

3a) $\begin{cases} x-y=-1 & \cdots (1) \\ x+y=3 & \cdots (2) \end{cases}$ add

$2x=2$

$\boxed{x=1}$

Sub value of x in (2)

$x+y=3$

$1+y=3$

$\boxed{y=2}$

Thus, the couple (1,2) is a solution of the formed system.

b) [CA) is tangent to (C) of radius [OA] (given)

So, $C\hat{A}O = 90°$ (tangent theorem: angle formed between radius & tangent)

Apply pyth. theorem in right $\triangle CAO$:

$CO^2 = CA^2 + AO^2$

$CO^2 = (2x+y)^2 + (x+y)^2$

$= (2+2)^2 + (1+2)^2$

$CO^2 = 25$

$\boxed{CO = 5cm}$