Step-1

Given points are $(0,y_1),(1,y_2),(2,y_3)$, we have to find that under what conditions on y_1,y_2,y_3 do the given points lie on a straight line.

Three points are said to be lie on the same line if the area of the triangle formed with these three points is zero.

Step-2

The area of the triangle from the analytical geometry gives,

$$\frac{1}{2}\left|x_1(y_2-y_3)+x_2(y_3-y_1)+x_3(y_1-y_2)\right|=0$$

$$\Rightarrow \frac{1}{2}\left|0(y_2-y_3)+1(y_3-y_1)+2(y_1-y_2)\right|=0$$
$$\Rightarrow \left|0+y_3-y_1+2y_1-2y_2\right|=0$$
$$\Rightarrow y_3+y_1-2y_2=0$$
$$\Rightarrow 2y_2=y_1+y_3$$

So the relation between y_1,y_2,y_3 is $\boxed{2y_2=y_1+y_3}$