

Chapter 13 / Example 8

Finding the parameter from a Poisson distribution

The random variable T is modelled by a Poisson distribution. Given that $P(T > 3) = 0.53$, find the variance of T .

$T \sim Po(\lambda)$. Find $P(T > 3) = P(T \geq 4)$.

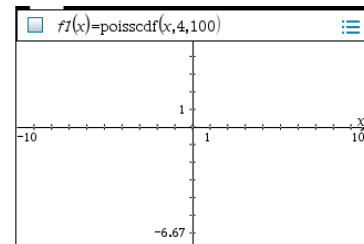
Open a new document and add a Graphs page.

The entry line is displayed at the top of the work area.

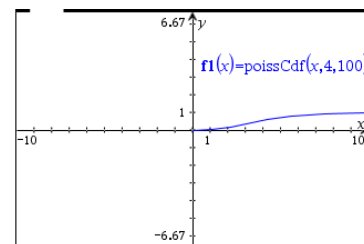
The default graph type is function, so ' $f1(x)=$ ' is displayed.

The default axes are $-10 \leq x \leq 10$ and $-6.67 \leq y \leq 6.67$.

Type `poisscdf(x,4,100)`.

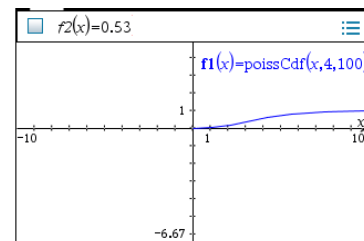


The GDC displays the graph $f1(x) = \text{poisscdf}(x, 4, 100)$ with the default axes.



Press **tab** to display the entry line again. This time ' $f2(x)=$ ' is displayed.

Type 0.53 and press **enter**.

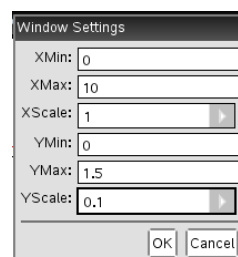


Modify the window settings to display the graphs.

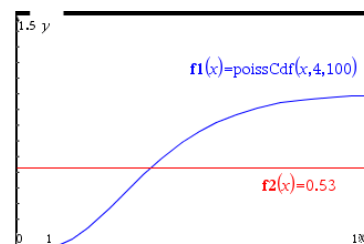
Press **menu** 4:Window/Zoom | 1:Window Settings...

Set the axes to show $0 \leq x \leq 10$ with a scale of 1 and $0 \leq y \leq 1.5$ with a scale of 0.1.

Press **enter** when you have finished.



The GDC displays the graphs in a suitable window.



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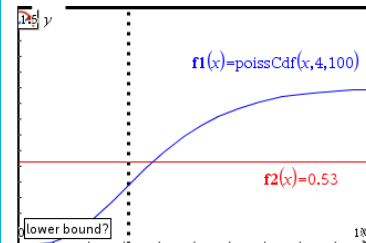
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Press **menu** 6:Analyse Graph | 4:Intersection.

To find the intersection you need to give the lower and upper bounds of the region that includes the intersection.

The GDC shows a line and asks you to set the lower bound. Move the line using the touchpad and choose a position to the left of the intersection.

Click the touchpad.

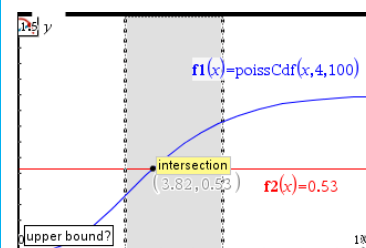


The GDC shows another line and asks you to set the upper bound.

Use the touchpad to move the line so that the region between the lower and upper bounds contains the intersection.

When the region contains the intersection, the calculator will display the word 'intersection' in a box.

Click the touchpad.



The GDC displays the intersection of the curve and the line at the point $(3.82, 0.53)$.

Hence $\lambda = 3.82$.

Variance = 3.82.

