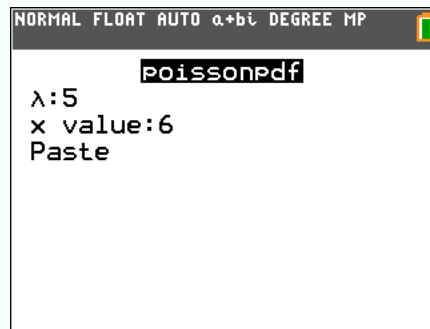## 4.15 Poisson distribution

4.15.1 Compute $\mathbf{P}(X = a)$

Consider $X \sim \text{Po}(5)$. Say you want to know $\mathbf{P}(X = 6)$.

Press ⟦2nd⟧ , ⟦vars⟧ , **poissonPdf(** and fill the parameters as follows:

```
NORMAL FLOAT AUTO a+bi DEGREE MP    ▯
            poissonPdf
 λ:5
 x value:6
 Paste
```
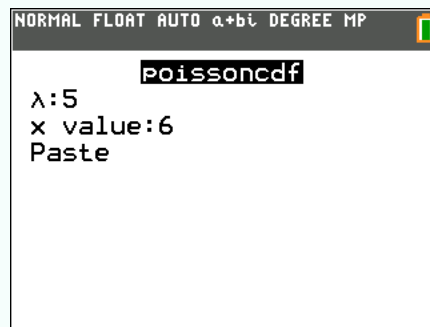
Pres **Paste** and ⟦enter⟧ . The result should be 0.146 (rounded).

4.15.2 Compute $\mathbf{P}(X \leq a)$

Consider $X \sim \text{Po}(5)$. Say you want to know $\mathbf{P}(X \leq 6)$.

Press ⟦2nd⟧ , ⟦vars⟧ , **poissoncdf(** and fill the parameters as follows:

```
NORMAL FLOAT AUTO a+bi DEGREE MP    ▯
            poissoncdf
 λ:5
 x value:6
 Paste
```

Pres **Paste** and ⟦enter⟧ . The result should be 0.762 (rounded).

4.15.3 Graph a Poisson distribution

Consider $X \sim \text{Po}(5)$. Suppose you want to graph it.

① Since a Poisson distribution can only have integers values, put your calculator in sequence mode (press ⟦mode⟧ and highlight ⟦SEQ⟧, 4th line).

② Press $\overset{\text{stat plot f1}}{\boxed{\text{y=}}}$, and fill the parameters as follows:

```
NORMAL FLOAT AUTO a+bi DEGREE MP
INITIAL CONDITION
 Plot1  Plot2  Plot3
 TYPE: SEQ(n)   SEQ(n+1)   SEQ(n+2)
 nMin=0
■∖u(n)⊟poissonpdf(5,n)
 u(0)⊟
 u(1)=
■∖v(n)=
 v(0)=
 v(1)=
■∖w(n)=
```

see 4.15.1 to enter `Poissonpdf(`,

and press $\overset{\text{link}}{\boxed{\text{x,т,θ,n}}}$ for `x value`

③ Choose a proper window :

```
NORMAL FLOAT AUTO a+bi DEGREE MP

WINDOW
 nMin=0
 nMax=20
 PlotStart=1
 PlotStep=1
 Xmin=-1
 Xmax=20
 Xscl=1
 Ymin=-0.1
↓Ymax=0.3
```

Press $\overset{\text{tblset f2}}{\boxed{\text{window}}}$ to access this screen

④ Press $\overset{\text{table f5}}{\boxed{\text{graph}}}$. The following should display:

```
NORMAL FLOAT AUTO a+bi DEGREE MP
```