In[•]:=
```
Clear["Global`*"]
SetDirectory[FileNameJoin[{NotebookDirectory[], "../figs/"}]]
```

Out[•]=
```
/Users/marknovak/Git/aaaManuscripts/GeometricComplexity/GeometricComplexity/figs
```

$$\mathrm{SC}_2 = -\mathrm{Log}_e f\left(x \mid \hat{\Theta}_x\right) + \frac{k}{2}\mathrm{Log}_e\left(\frac{n}{2\pi}\right) + \mathrm{Log}_e \int_\Theta \sqrt{\det I(\Theta)}\, d\Theta + o(1);$$

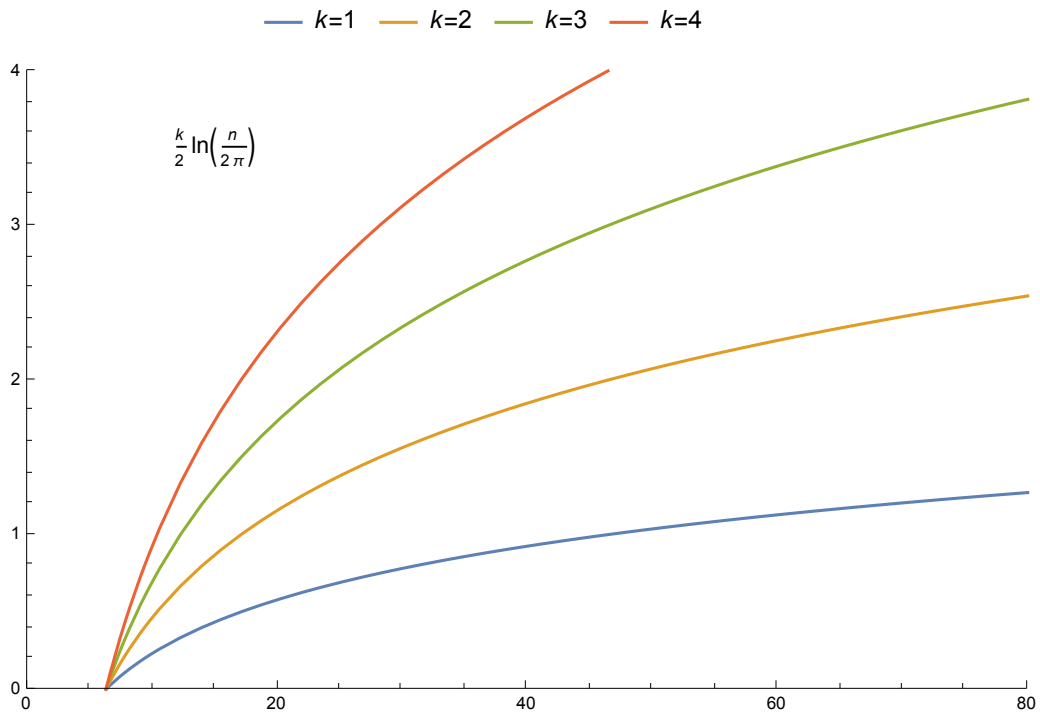
The first term is the likelihood. The second term
is the parameter and sample size dependent component.
The third term containing $I(\Theta)$, the Expected Fisher Information Matrix,
reflects the model's flexibility.

In[•]:=
```
cm = 72 / 2.54;
```

Second Term dependence on k and n

In[•]:=
```
nmax = 80;
p1 =
 Plot[
  Evaluate@Table[k/2 Log[n/(2 π)], {k, 1, 4}], {n, 1, nmax},
  PlotRange → {{0, nmax}, {0, 4}},
  PlotLegends → Placed[{"k=1", "k=2", "k=3", "k=4"}, Above],
  PlotRangeClipping → False,
  ImagePadding → {{50, 5}, {30, 5}},
  Epilog → {
    Style[Text["k/2 ln[n/(2 π)]", {15, 3.5}], 12],
    Text[Style["Sample size (n)", 13], Scaled[{0.5, -0.2}]], Rotate[
     Text[Style["Parametric\ncomplexity", 13], Scaled[{-0.2, 0.5}]], 90 Degree]
   },
  ImageSize → Large
 ]
Export["ParamComp_2ndTerm.pdf", Show[p1, ImageSize → 8 cm]];
```

Out[•]=



For reference, the sample size of the largest dataset in Novak & Stouffer 2021 is $n = 528$.

The smallest is $n = 10$.

And the median is $n = 80$.

In[•]:=
```
PC = Round[
     N[{Table[k / 2 Log[n / (2 π)] /. n → 10, {k, 1, 4}],
       Table[k / 2 Log[n / (2 π)] /. n → 80, {k, 1, 4}],
       Table[k / 2 Log[n / (2 π)] /. n → 528, {k, 1, 4}]}]
     , 1 / 10.] // Transpose // TableForm
```

Out[•]//TableForm=

0.2	1.3	2.2
0.5	2.5	4.4
0.7	3.8	6.6
0.9	5.1	8.9