

Gaussian Integral

Integrating over the limits of 2σ

$$\frac{1}{\sigma\sqrt{2\pi}} * \text{Exp}\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right]$$

898 keV:

■ Singles:

r6978

In[2028]:=

$\mu = 897.416;$

$\sigma = 1.12141;$

$$\frac{1}{\sigma\sqrt{2\pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right], \{x, 893, 900\}\right]$$

Out[2030]=

0.9893543691

r7022

In[1971]:=

$\mu = 897.481;$

$\sigma = 0.750439;$

$$\frac{1}{\sigma\sqrt{2\pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right], \{x, 895, 899\}\right]$$

Out[1973]=

0.9780494834

r7107

In[1974]:=

$\mu = 897.581;$

$\sigma = 1.09091;$

$$\frac{1}{\sigma\sqrt{2\pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2\right], \{x, 895, 900\}\right]$$

Out[1976]=

0.977709827

r7203

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In[1977]:=  $\mu = 897.352;$   

 $\sigma = 2.97881;$   

 $\frac{1}{\sigma \sqrt{2 * \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 891, 904\}\right]$ 
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Out[1979]= 0.9706975195
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r7235

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In[1980]:=  $\mu = 903.390;$   

 $\sigma = 0.952662;$   

 $\frac{1}{\sigma \sqrt{2 * \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 901, 906\}\right]$ 
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Out[1982]= 0.9908673621
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■ **Coincidence:**

r6980

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In[1983]:=  $\mu = 895.417;$   

 $\sigma = 1.19573;$   

 $\frac{1}{\sigma \sqrt{2 * \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 893, 898\}\right]$ 
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Out[1985]= 0.9629995985
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r7023

```
In[1986]:=  $\mu = 896.893;$   

 $\sigma = 1.00875;$   

 $\frac{1}{\sigma \sqrt{2 * \pi}} * \text{Integrate}\left[\text{Exp}\left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma}\right)^2\right], \{x, 894, 899\}\right]$ 
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Out[1988]= 0.9795677049
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r7108

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In[1989]:=  $\mu = 897.483;$   

 $\sigma = 1.24805;$   

 $\frac{1}{\sigma \sqrt{2 * \pi}} * \text{Integrate}[\text{Exp}[-\frac{1}{2} (\frac{x - \mu}{\sigma})^2], \{x, 894, 900\}]$ 
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Out[1991]= 0.9755097185
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r7204

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In[1992]:=  $\mu = 903.99;$   

 $\sigma = 1.06558;$   

 $\frac{1}{\sigma \sqrt{2 * \pi}} * \text{Integrate}[\text{Exp}[-\frac{1}{2} (\frac{x - \mu}{\sigma})^2], \{x, 901, 907\}]$ 
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Out[1994]= 0.9951259818
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r7236

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In[1995]:=  $\mu = 905.750;$   

 $\sigma = 1.09901;$   

 $\frac{1}{\sigma \sqrt{2 * \pi}} * \text{Integrate}[\text{Exp}[-\frac{1}{2} (\frac{x - \mu}{\sigma})^2], \{x, 903, 908\}]$ 
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Out[1997]= 0.9735152373
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1836.1 keV:

■ Singles:

r6978

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In[1998]:=  $\mu = 1837.6;$   

 $\sigma = 1.19410;$   

 $\frac{1}{\sigma \sqrt{2 * \pi}} * \text{Integrate}[\text{Exp}[-\frac{1}{2} (\frac{x - \mu}{\sigma})^2], \{x, 1835, 1840\}]$ 
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Out[2000]= 0.9630517475
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r7022

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In[2001]:=  $\mu = 1837.72;$   

 $\sigma = 1.28517;$   

 $\frac{1}{\sigma \sqrt{2 * \pi}} * \text{Integrate} \left[ \text{Exp} \left[ -\frac{1}{2} \left( \frac{x - \mu}{\sigma} \right)^2 \right], \{x, 1835, 1841\} \right]$ 
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Out[2003]= 0.9774944053
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r7107

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In[2004]:=  $\mu = 1838.56;$   

 $\sigma = 1.22172;$   

 $\frac{1}{\sigma \sqrt{2 * \pi}} * \text{Integrate} \left[ \text{Exp} \left[ -\frac{1}{2} \left( \frac{x - \mu}{\sigma} \right)^2 \right], \{x, 1836, 1841\} \right]$ 
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Out[2006]= 0.9590299797
```

r7203

```
In[2007]:=  $\mu = 1839.05;$   

 $\sigma = 4.91678;$   

 $\frac{1}{\sigma \sqrt{2 * \pi}} * \text{Integrate} \left[ \text{Exp} \left[ -\frac{1}{2} \left( \frac{x - \mu}{\sigma} \right)^2 \right], \{x, 1829, 1849\} \right]$ 
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Out[2009]= 0.9580228155
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r7235

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In[2010]:=  $\mu = 1850.02;$   

 $\sigma = 1.13536;$   

 $\frac{1}{\sigma \sqrt{2 * \pi}} * \text{Integrate} \left[ \text{Exp} \left[ -\frac{1}{2} \left( \frac{x - \mu}{\sigma} \right)^2 \right], \{x, 1847, 1853\} \right]$ 
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Out[2012]= 0.9917563429
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■ **Coincidence:**

r6980

In[2013]:=

 $\mu = 1833.39;$
 $\sigma = 1.72362;$

$$\frac{1}{\sigma \sqrt{2 \pi}} * \text{Integrate} \left[\text{Exp} \left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma} \right)^2 \right], \{x, 1829, 1837\} \right]$$

Out[2015]=

0.9764559017

r7023

In[2016]:=

 $\mu = 1836.02;$
 $\sigma = 1.63517;$

$$\frac{1}{\sigma \sqrt{2 \pi}} * \text{Integrate} \left[\text{Exp} \left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma} \right)^2 \right], \{x, 1832, 1840\} \right]$$

Out[2018]=

0.9855567383

r7108

In[2019]:=

 $\mu = 1838.12;$
 $\sigma = 1.87659;$

$$\frac{1}{\sigma \sqrt{2 \pi}} * \text{Integrate} \left[\text{Exp} \left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma} \right)^2 \right], \{x, 1834, 1842\} \right]$$

Out[2021]=

0.9665953401

r7204

In[2022]:=

 $\mu = 1824.15;$
 $\sigma = 1.66372;$

$$\frac{1}{\sigma \sqrt{2 \pi}} * \text{Integrate} \left[\text{Exp} \left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma} \right)^2 \right], \{x, 1820, 1828\} \right]$$

Out[2024]=

0.9833603093

r7236

In[2025]:=

 $\mu = 1854.44;$
 $\sigma = 1.94463;$

$$\frac{1}{\sigma \sqrt{2 \pi}} * \text{Integrate} \left[\text{Exp} \left[-\frac{1}{2} \left(\frac{x - \mu}{\sigma} \right)^2 \right], \{x, 1850, 1859\} \right]$$

Out[2027]=

0.9792754149