In[1]:=
```
c = Log[10^-1.7]
```

Out[1]=
```
-3.91439
```

In[2]:=
```
TeV[x_] := N[Log10[x] + 12]
```

In[3]:=
```
flux[x_] := Exp[c x]
```

In[4]:=
```
G1[x_, μ_, σ_] := PDF[NormalDistribution[μ, σ], x]
G[x_, μ_] := G1[x, μ, 0.2]
G1[x, μ, σ]
G[x, μ]
```

Out[6]=
$$\frac{e^{-\frac{(x-\mu)^2}{2\sigma^2}}}{\sqrt{2\pi}\ \sigma}$$

Out[7]=
$$1.99471\ e^{-12.5\ (x-\mu)^2}$$

Distribution of particles with measured energy *x*

In[8]:=
```
Px[x_] := Integrate[G[x, μ] * flux[x], {μ, TeV[12], ∞}]
```

The join distribution

In[9]:=
```
joint[x_, μ_] := G[x, μ] * flux[x] / Px[x]
```

Flux of particles with measured energy above 5 TeV whose energy was really above 5 TeV

In[10]:=
```
A = NIntegrate[joint[x, μ], {x, TeV[5], ∞}, {μ, TeV[5], ∞}]
```

Out[10]=
```
5.1445
```

The flux of all particles with measured energy above 5 TeV

In[11]:=
```
B = NIntegrate[joint[x, μ], {x, TeV[5], ∞}, {μ, TeV[1], ∞}, PrecisionGoal → 12,
  MaxRecursion → 20, Method → {GlobalAdaptive, MaxErrorIncreases → 10 000}]
```

NIntegrate::slwcon :
Numerical integration converging too slowly; suspect one of the following: singularity, value of the integration is 0, highly oscillatory integrand, or WorkingPrecision too small. ≫

Out[11]=
```
10.2955
```

Fraction of particles with measured energy above 5 TeV whose energy was really above 5 TeV

In[12]:=
```
A / B
```

Out[12]=
```
0.499686
```