In[5]:=
```
Integral[n_] =
  Integrate[ψ^n Exp[-2 ψ d/z$r], {ψ, 0, ∞}, Assumptions → {Element[n, Integers],
    n ⩾ 0, Element[d, Reals], d > 0, Element[z$r, Reals], z$r > 0}]
```

Out[5]=
$$2^{-1-n} \left(\frac{z\$r}{d}\right)^{1+n} \text{Gamma}[1+n]$$

In[7]:=
```
Integral[0]
```

Out[7]=
$$\frac{z\$r}{2\,d}$$

In[8]:=
```
Integral[1]
```

Out[8]=
$$\frac{z\$r^2}{4\,d^2}$$

In[9]:=
```
Integral[2]
```

Out[9]=
$$\frac{z\$r^3}{4\,d^3}$$

In[11]:=
```
Integrate[ψ^0 Exp[-2 ψ], {ψ, 0, ∞}]
```

Out[11]=
$$\frac{1}{2}$$

In[12]:=
```
Integrate[ψ^1 Exp[-2 ψ], {ψ, 0, ∞}]
```

Out[12]=
$$\frac{1}{4}$$

In[13]:=
```
Integrate[ψ^2 Exp[-2 ψ], {ψ, 0, ∞}]
```

Out[13]=
$$\frac{1}{4}$$

In[14]:=
```
Table[Gamma[1 + n] , {n, 0, 2, 1}]
```

Out[14]=
$$\{1, 1, 2\}$$

In[15]:=
```
{Gamma[1], Gamma[2], Gamma[3]}
```

Out[15]=
$$\{1, 1, 2\}$$

In[16]:=
```
Table[1/2^(n+2) (-1)^(n+1) Gamma[1 + n] , {n, 0, 2, 1}]
```

Out[16]=
$$\left\{-\frac{1}{4}, \frac{1}{8}, -\frac{1}{8}\right\}$$