$$\int \mathbf{LogIntegral}[\mathbf{a}+\mathbf{b}\,\mathbf{x}]^{\mathbf{n}}\,\mathbf{dx}$$

- **Derivation: Integration by parts**
- **Rule:**

$$\int \mathbf{LogIntegral}[\mathbf{a}+\mathbf{b}\,\mathbf{x}]\,\mathbf{dx} \;\rightarrow\; \frac{(\mathbf{a}+\mathbf{b}\,\mathbf{x})\,\mathbf{LogIntegral}[\mathbf{a}+\mathbf{b}\,\mathbf{x}]}{\mathbf{b}} - \frac{\mathbf{ExpIntegralEi}[\mathbf{2}\,\mathbf{Log}[\mathbf{a}+\mathbf{b}\,\mathbf{x}]]}{\mathbf{b}}$$

- **Program code:**

```
Int[LogIntegral[a_.+b_.*x_],x_Symbol] :=
  (a+b*x)*LogIntegral[a+b*x]/b - ExpIntegralEi[2*Log[a+b*x]]/b /;
FreeQ[{a,b},x]
```

$$\int x^m \, \text{LogIntegral}[a + b\,x]^n \, dx$$

- **Derivation: Integration by parts**
- **Rule: If $m + 1 \neq 0$, then**

$$\int x^m \, \text{LogIntegral}[a + b\,x] \, dx \;\to\; \frac{x^{m+1} \, \text{LogIntegral}[a + b\,x]}{m+1} - \frac{b}{m+1} \int \frac{x^{m+1}}{\text{Log}[a + b\,x]} \, dx$$

- **Program code:**

```
Int[x_^m_.*LogIntegral[a_.+b_.*x_],x_Symbol] :=
  x^(m+1)*LogIntegral[a+b*x]/(m+1) -
  Dist[b/(m+1),Int[x^(m+1)/Log[a+b*x],x]] /;
FreeQ[{a,b,m},x] && NonzeroQ[m+1]
```