```
Dd[x_, 0, a_] := 1
Dd[x_, k_, a_] := Dd[x, k, a] = Sum[Dd[x / (j + a), k - 1, a], {j, 0, x - a}]
Cc[x_, k_, a_] := a^(-k) Dd[x a^k, k, a + 1]
pp[x_, a_] := Sum[(-1)^(k + 1) / k Cc[x, k, a], {k, 1, 20}]

Cc[100, 2, 1]
```

283

```
pp[10, 2]
```

$Aborted

```
Expand[Integrate[(LogIntegral[100 / x] - EulerGamma - Log[Log[100 / x]]), {x, 1, 100}]]
```

```
N[101 EulerGamma - 100 ExpIntegralEi[-Log[100]] + 101 Log[Log[100]] - LogIntegral[100]]
```

182.601

```
Integrate[(LogIntegral[100 / x] - EulerGamma - Log[Log[100 / x]]), {x, 1, 100}]
```

101 EulerGamma - 100 ExpIntegralEi[-Log[100]] + 101 Log[Log[100]] - LogIntegral[100]

```
ExpIntegralEi[-Log[100.]]
```

-0.00182974

```
LogIntegral[Log[Log[100.]]]
```

0.190652

```
LogIntegral[100.]
```

30.1261

```
ExpIntegralEi[Log[100.]]
```

30.1261

```
101 EulerGamma - 100 ExpIntegralEi[-Log[100]] + 101 Log[Log[100]] - ExpIntegralEi[Log[100]]
```

101 EulerGamma - 100 ExpIntegralEi[-Log[100]] - ExpIntegralEi[Log[100]] + 101 Log[Log[100]]

```
Expand[Integrate[(LogIntegral[100 / x]), {x, 1, 100}]]
```

100 EulerGamma + 100 Log[Log[100]] - LogIntegral[100]

```
Expand[Integrate[(Log[Log[100 / x]]), {x, 1, 100}]]
```

-100 EulerGamma + 100 ExpIntegralEi[-Log[100]] - Log[Log[100]]

```
Expand[Integrate[(Log[Log[100] - Log[x]]), {x, 1, 100}]]
```

-100 EulerGamma + 100 ExpIntegralEi[-Log[100]] - Log[Log[100]]

```
Expand[Integrate[(Log[Log[100]]), {x, 1, 100}]]
```

99 Log[Log[100]]

```
Expand[Integrate[(Log[-Log[x]]), {x, 1, 100}]]
```

EulerGamma + 99 i π + 100 Log[Log[100]] - LogIntegral[100]

```
Expand[Integrate[(Log[Log[100] - Log[x]]), {x, 1, 100}]]
```

-100 EulerGamma + 100 ExpIntegralEi[-Log[100]] - Log[Log[100]]

```
N[-100 EulerGamma + 100 ExpIntegralEi[-Log[100]] - Log[Log[100]]]
```

```
-59.4317
```

```
N[Expand[Integrate[(Log[-Log[x]]), {x, 1, 100}]] -
  Expand[Integrate[(Log[Log[100]]), {x, 1, 100}]]]
```

```
-28.0217 + 311.018 i
```

```
N[Expand[Integrate[(LogIntegral[100 / x] - EulerGamma - Log[Log[100 / x]]), {x, 1, 100}]]]
```

```
182.601
```

```
Expand[Integrate[(Log[Log[100] - Log[x]]), {x, 1, 100}]]
```

```
-100 EulerGamma + 100 ExpIntegralEi[-Log[100]] - Log[Log[100]]
```

```
Expand[Integrate[(Log[a - Log[x]]), {x, 1, 100}]]
```

```
e^a ExpIntegralEi[-a] - e^a ExpIntegralEi[-a + Log[100]] - Log[a] + 100 Log[a - Log[100]]
```

```
Limit[e^a ExpIntegralEi[-a] - e^a ExpIntegralEi[-a + Log[100]] -
  Log[a] + 100 Log[a - Log[100]], a → Log[100]]
```

```
-100 EulerGamma + 100 ExpIntegralEi[-Log[100]] - Log[Log[100]]
```

```
N[-100 EulerGamma + 100 ExpIntegralEi[-Log[100]] - Log[Log[100]]]
```

```
-59.4317
```

```
N[-100 EulerGamma + 100 ExpIntegralEi[Log[1 / 100]] - Log[Log[100]]]
```

```
-59.4317
```

```
N[-100 EulerGamma + 100 LogIntegral[1 / 100] - Log[Log[100]]]
```

```
-59.4317
```

```
N[101 EulerGamma - 100 ExpIntegralEi[-Log[100]] + 101 Log[Log[100]] - LogIntegral[100]]
```

```
182.601
```

```
N[101 EulerGamma - 100 LogIntegral[1 / 100] + 101 Log[Log[100]] - LogIntegral[100]]
```

```
182.601
```

```
N[100 EulerGamma - 100 LogIntegral[1 / 100] +
  101 Log[Log[100]] - (LogIntegral[100] - EulerGamma)]
```

```
182.601
```

```
N[-100 (LogIntegral[1 / 100] - EulerGamma - Log[Log[1 / 100]]) -
  100 Pi I - (LogIntegral[100] - EulerGamma - Log[Log[100]])]
```

```
182.601 + 0. i
```

```
N[-100 (LogIntegral[1 / 100] - EulerGamma - Log[Log[100]]) -
  (LogIntegral[100] - EulerGamma - Log[Log[100]])]
```

```
182.601
```

```
N[Integrate[(LogIntegral[30 / x] - EulerGamma - Log[Log[30 / x]]), {x, 1, 30}]]
```

```
43.0554
```

```
N[-30 (LogIntegral[1 / 30] - EulerGamma - Log[Log[30]]) -
  (LogIntegral[30] - EulerGamma - Log[Log[30]])]
```

```
43.0554
```

```
N[(30 + 1) (EulerGamma + Log[Log[30]]) - 30 LogIntegral[1 / 30] - LogIntegral[30]]
```

```
43.0554
```

```
N[Integrate[(LogIntegral[130 / x] - EulerGamma - Log[Log[130 / x]]), {x, 1, 130}]]
```

```
246.655
```

```
N[(130 + 1) (EulerGamma + Log[Log[130]]) - 130 LogIntegral[1 / 130] - LogIntegral[130]]
```

```
246.655
```

```
Integrate[(LogIntegral[130 / x]), {x, 1, 130}]
```

```
130 EulerGamma + 130 Log[Log[130]] - LogIntegral[130]
```