

```

f1[n_, k_, b_] := Sum[ (-1)^j Binomial[k, j] b^j f[n b^-j], {j, 0, Log[b, n]}]
f2[n_, k_, b_] := Sum[ Binomial[k + j - 1, k - 1] b^j f1[n b^-j, k, b], {j, 0, Log[b, n]}]

f[n_] := If[Mod[n, 8] < 4, 1, 0]

f1[10, I, 1.01]
14.3143 - 2.42347 i

f1[15, 1/2, 2]

$$-\frac{45}{16}$$


```

```
FullSimplify[f2[100, I, 1.1]]
```

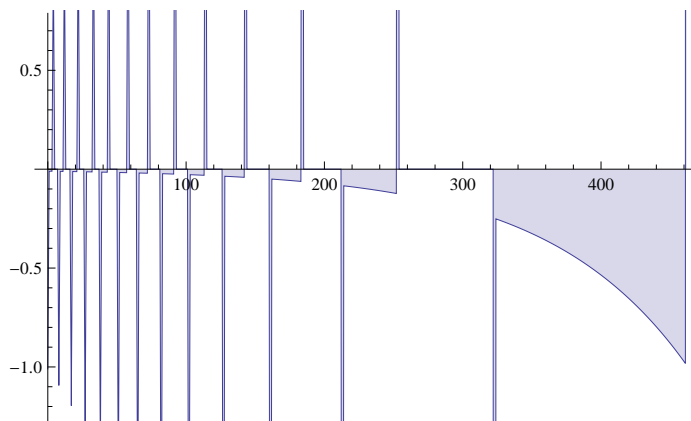
```
-0.506366 - 9.32587 × 10-15 i
```

```
f3[n_, k_, b_] := DiscretePlot[ (-1)^j Binomial[k, j] b^j f[n/b^j], {j, 0, Log[b, n]}]
```

```
f4[n_, k_, b_] :=
```

```
DiscretePlot[ Binomial[k + j - 1, k - 1] b^j f1[n/b^j, k, b], {j, 0, Log[b, n]}]
```

```
f4[100, 1, 1.01]
```



```
f1a[n_, k_, b_] := Sum[ Binomial[k, j] b^j f[n/b^j], {j, 0, Log[b, n]}]
```

```
f2a[n_, k_, b_] :=
```

```
Sum[ (-1)^j Binomial[k + j - 1, k - 1] b^j f1a[n/b^j, k, b], {j, 0, Log[b, n]}]
```

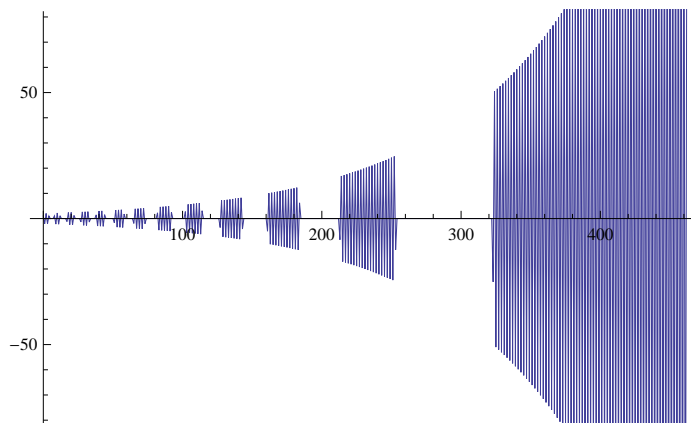
```
f2a[10, 2, 2]
```

```
10
```

```
f4a[n_, k_, b_] :=
```

```
DiscretePlot[ (-1)^j Binomial[k + j - 1, k - 1] b^j f1a[n/b^j, k, b], {j, 0, Log[b, n]}]
```

f4a[100, 1, 1.01]



```
f1b[n_, k_, b_] := Sum[ (-1)^j Binomial[k, j] f[n / b^j], {j, 0, Log[b, n]}]
```

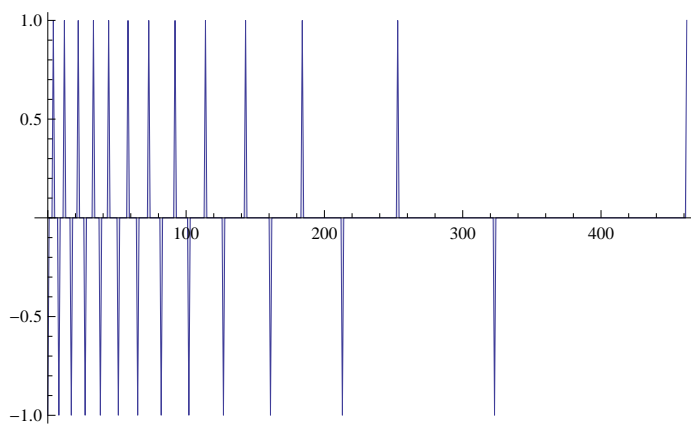
```
f2b[n_, k_, b_] := Sum[ Binomial[k + j - 1, k - 1] f1b[n / b^j, k, b], {j, 0, Log[b, n]}]
```

f2b[10, 2, 2]

10

```
f4b[n_, k_, b_] := DiscretePlot[ Binomial[k + j - 1, k - 1] f1b[n / b^j, k, b], {j, 0, Log[b, n]}]
```

f4b[100, 1, 1.01]



```
f4b2[n_, k_, b_] := Table[ Binomial[k + j - 1, k - 1] f1b[n / b^j, k, b], {j, 0, Log[b, n]}]
```

f4b2[10, 2, 1.01] // TableForm

```
0
0
0
0
0
0
0
0
0
0
-10
11
0
0
0
```


[illegible]


```
0
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0
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0
0
0
0
0
0
0
0
0
0
0
-231
232

f4a2[n_, k_, b_] :=
Table[ Binomial[k + j - 1, k - 1] b^j fl[n / b^j, k, b], {j, 0, Log[b, n]}] // TableForm

f4a2[10, 2, 1.01] // TableForm
```

-2.0008
-0.001616
-0.00244824
-0.00329696
-0.00416242
-0.00504485
-0.00594451
-0.00686167
-0.00779657
-0.00874948
-0.00972067
-0.0107104
-0.011719
-0.0127466
-0.0137937
-0.0148604
-0.0159471
-0.017054
-0.0181814
-0.0193297
-0.0204992
55.2935
-57.2741
-0.0181031
-0.019046
-0.0200059
-0.0209832
-0.0219779
-0.0229905
-0.0240211
-0.02507
-0.0261375
-0.0272238
-0.0283293
-0.0294541
-0.0305986
-0.0317631
-0.0329477
-0.0341529
-0.0353789
-0.036626
-0.0378946
-0.0391848
-0.040497
-0.0418316
-0.0431888
-0.0445689
-0.0459724
-0.0473994
-0.0488505
171.074
-172.787
-0.035567
-0.0366005
-0.037651
-0.038719

-0.0398045
-0.0409078
-0.0420293
-0.043169
-0.0443274
-0.0455046
-0.046701
-0.0479167
-0.049152
-0.0504073
-0.0516827
-0.0529787
-0.0542953
-0.055633
-0.0569921
-0.0583727
-0.0597753
-0.0612001
-0.0626474
-0.0641175
-0.0656108
-0.0671275
-0.068668
-0.0702326
-0.0718216
-0.0734353
-0.0750742
-0.0767385
-0.0784286
-0.0801448
-0.0818875
-0.083657
-0.0854537
-0.087278
-0.0891302
464.109
-464.647
-0.0474292
-0.0484131
-0.0494119
-0.0504259
-0.0514552
-0.0525001
-0.0535607
-0.0546372
-0.05573
-0.0568391
-0.0579649
-0.0591074
-0.0602671
-0.061444
-0.0626384
-0.0638506
-0.0650807
-0.0663291
-0.0675959

-0.0688815
-0.0701859
-0.0715096
-0.0728528
-0.0742156
-0.0755984
-0.0770015
-0.078425
-0.0798694
-0.0813347
-0.0828214
-0.0843297
-0.0858599
-0.0874122
-0.0889871
-0.0905846
-0.0922052
-0.0938492
-0.0955168
-0.0972084
-0.0989243
-0.100665
-0.10243
-0.104221
-0.106037
-0.107879
-0.109747
-0.111642
-0.113564
-0.115513
-0.11749
-0.119495
-0.121528
-0.12359
-0.125681
-0.127801
-0.129951
-0.132131
-0.134342
-0.136584
-0.138858
-0.141163
-0.1435
-0.145871
-0.148274
-0.15071
-0.153181
-0.155686
1613.9
-1608.
0.
0.
0.
0.
0.
0.

-1.99672×10^{-13}
0.
 -2.06096×10^{-13}
0.
 -2.12698×10^{-13}
0.
0.
0.
 -2.26452×10^{-13}
 -2.30008×10^{-13}
0.
 -2.37268×10^{-13}
0.
0.
0.
0.
0.
0.
 -2.64276×10^{-13}
 -2.68346×10^{-13}
0.
 -2.76652×10^{-13}
 -2.80889×10^{-13}
0.
0.
0.
0.
0.
0.
0.
 -3.12188×10^{-13}
0.
 -3.2168×10^{-13}
0.
 -3.31427×10^{-13}
0.
0.
 -3.46541×10^{-13}
0.
 -3.56955×10^{-13}
 -3.62266×10^{-13}
0.
0.
0.
 -3.84225×10^{-13}
 -3.89898×10^{-13}
 -3.95646×10^{-13}
0.
0.
0.
0.
 -4.25543×10^{-13}
0.
0.

```
0.  
-4.5091 × 10-13  
0.  
0.  
0.  
0.  
0.  
-4.91529 × 10-13  
-9.97224 × 10-13  
-2310.  
2320.
```