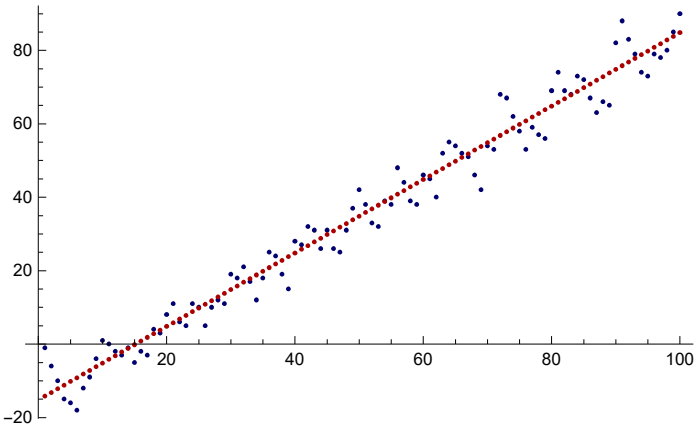
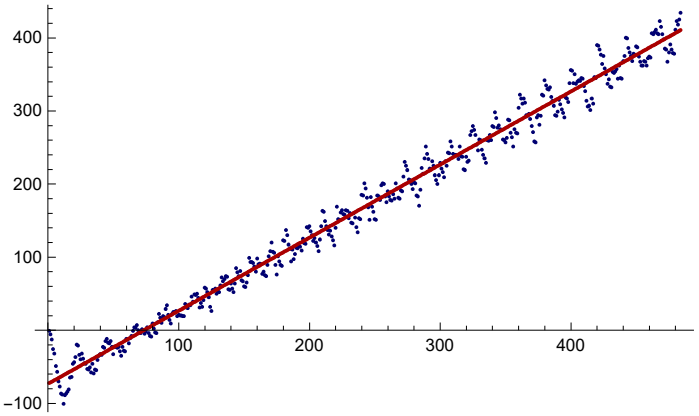
```
RamanujanSum[q_, n_] :=
  Sum[If[Divisible[q, a] == True && Divisible[n, a] == True, 1, 0] MoebiusMu[q/a] a, {a, 1, Min[q,n]}]
CohenMuSum[q_, n_, b_] :=
  Sum[If[Divisible[q, a] == True && Divisible[n, a^b] == True, 1, 0] MoebiusMu[q/a] a^b, {a, 1, Min[q,n]}]
DivisorBeta[k_, n_, b_] := Sum[If[Divisible[n, d^b] == True, 1, 0] d^(b*k), {d, 1, n}]
CohenMoment[y_, x_, b_] := Sum[Sum[CohenMuSum[q, n, b], {q, 1, x}], {n, 1, y}]
CohenMoment2[y_, x_, b_] := Sum[(Sum[CohenMuSum[q, n, b], {q, 1, x}])^2, {n, 1, y}]
DivisorBetaF[k_, n_, b_] := Sum[If[Divisible[n, a^b] == True, 1, 0] a^k, {a, 1, n}]
Explicit2Moment[y_, N_] :=
  Sum[Zeta[1 + ZetaZero[k]/2] (Zeta[ZetaZero[k]/2])^2 Zeta[-1 - ZetaZero[k]/2]
      y^(1 + ZetaZero[k]/2)/(Zeta'[ZetaZero[k]] (2 + ZetaZero[k])) +
    Zeta[1 + (1 - ZetaZero[k])/2] (Zeta[(1 - ZetaZero[k])/2])^2 Zeta[-1 - (1 - ZetaZero[k])/2]
      y^(1 + (1 - ZetaZero[k])/2)/(Zeta'[1 - ZetaZero[k]] (2 + 1 - ZetaZero[k])), {k, 1, N}]
f[β_, s_] = Zeta[1 - s/β] Zeta[2 + s - β]/(Zeta[1 + s])^2 1/((1 + s)^2 (β - s));
```

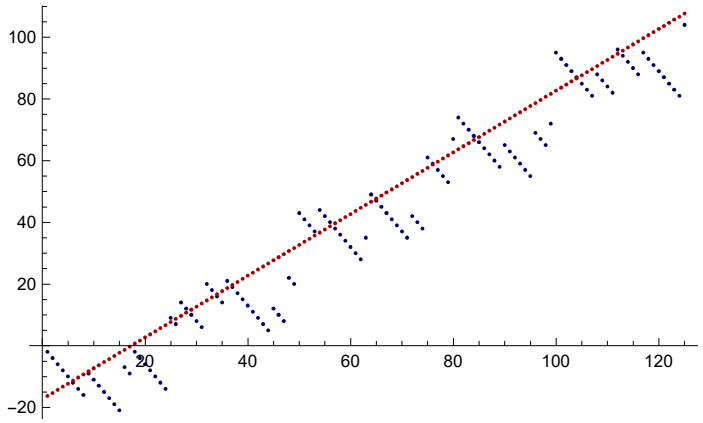
```
β = 1;
x = 10;
DiscretePlot[{CohenMoment[y, x, β], y - x^(1+β) / (2 (1 + β) Zeta[1 + β])}, {y, 1, x^(1+β)},
 AxesOrigin → {0, 0}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red]}]
```



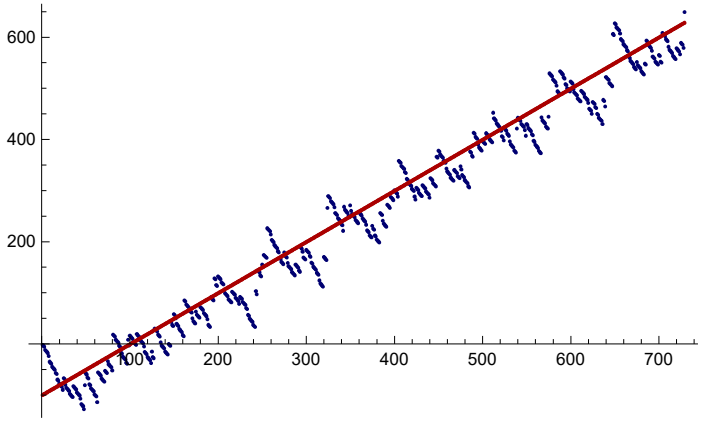

```
β = 1;
x = 22;
DiscretePlot[{CohenMoment[y, x, β], y - x^(1+β) / (2 (1 + β) Zeta[1 + β])}, {y, 1, x^(1+β)},
 AxesOrigin → {0, 0}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red]}]
```



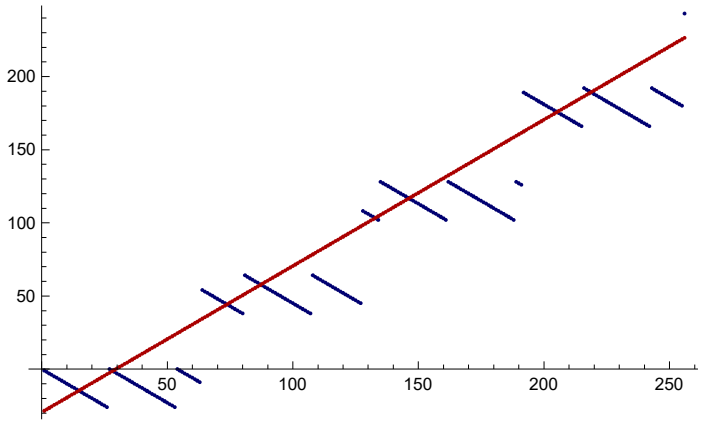
```
β = 2;
x = 5;
DiscretePlot[{CohenMoment[y, x, β], y - x^(1+β) / (2 (1 + β) Zeta[1 + β])}, {y, 1, x^(1+β)},
 AxesOrigin → {0, 0}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red]}]
```



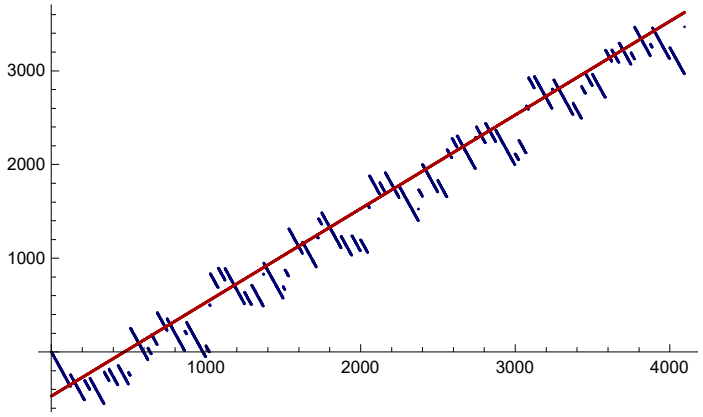

```
β = 2;
x = 9;
DiscretePlot[{CohenMoment[y, x, β], y - x^(1+β) / (2 (1 + β) Zeta[1 + β])}, {y, 1, x^(1+β)},
 AxesOrigin → {0, 0}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red]}]
```



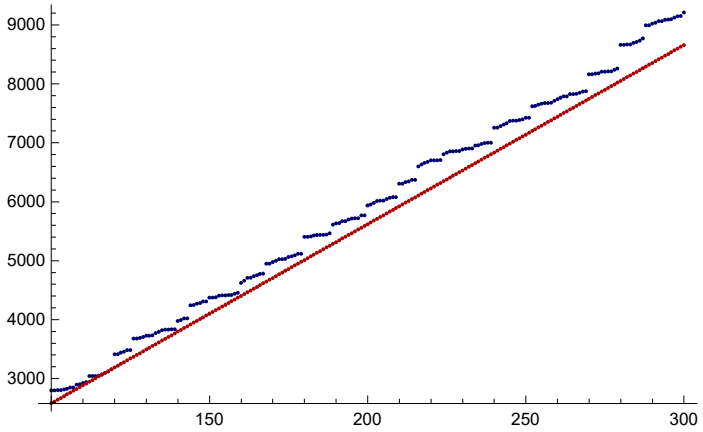
```
β = 3;
x = 4;
DiscretePlot[{CohenMoment[y, x, β], y - x^(1+β) / (2 (1 + β) Zeta[1 + β])}, {y, 1, x^(1+β)},
 AxesOrigin → {0, 0}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red]}]
```



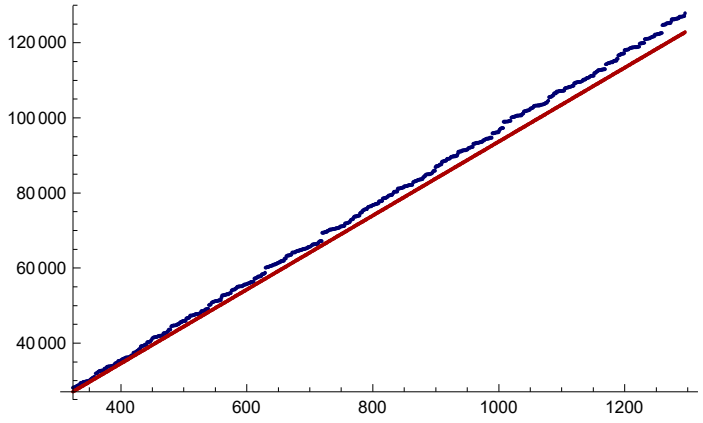

```
β = 3;
x = 8;
DiscretePlot[{CohenMoment[y, x, β], y - x^(1+β) / (2 (1 + β) Zeta[1 + β])}, {y, 1, x^(1+β)},
 AxesOrigin → {0, 0}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red]}]
```



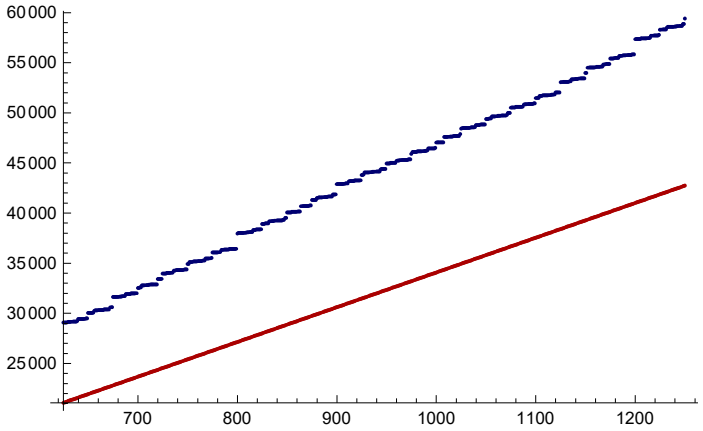
```
β = 1;
x = 10;
d = 3;
DiscretePlot[{CohenMoment2[y, x, β], y * x^(1+β) / ((1 + β) Zeta[1 + β]) - x^(2+2β) / (2 (1 + β)^2 (Zeta[1 + β])^2)}, {y, x^(2β), d * x^(2β)}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red], Darker[Green]}]
```



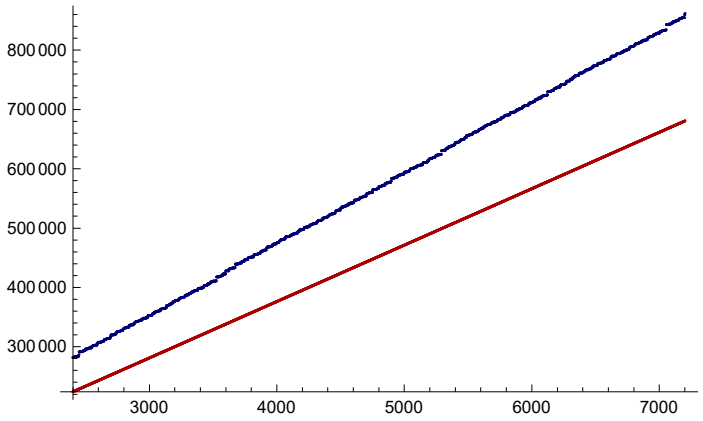

```
β = 1;
x = 18;
d = 4;
DiscretePlot[{CohenMoment2[y, x, β], y * x^(1+β) / ((1 + β) Zeta[1 + β]) - x^(2+2β) / (2 (1 + β)^2 (Zeta[1 + β])^2)}, {y, x^(2β), d * x^(2β)}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red], Darker[Green]}]
```



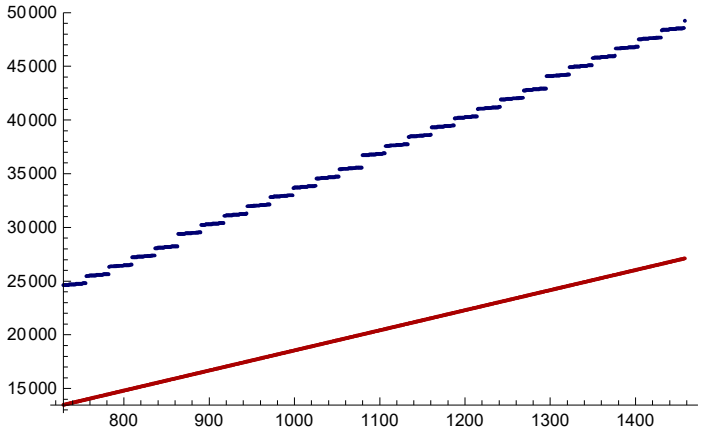
```
β = 2;
x = 5;
d = 2;
DiscretePlot[{CohenMoment2[y, x, β], y * x^(1+β) / ((1 + β) Zeta[1 + β]) - x^(2+2β) / (2 (1 + β)^2 (Zeta[1 + β])^2)}, {y, x^(2β), d * x^(2β)}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red], Darker[Green]}]
```



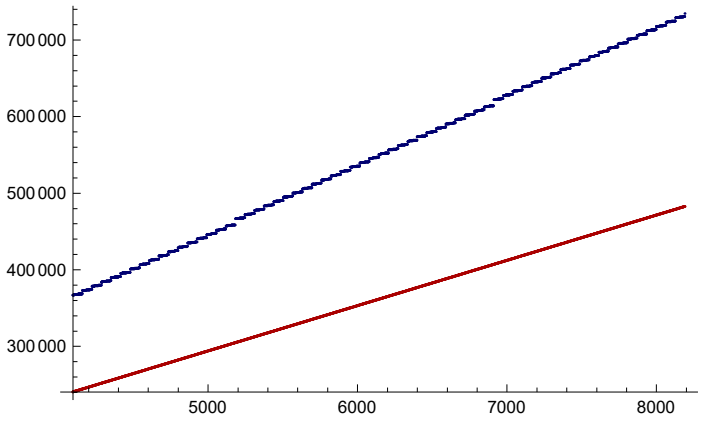

```
β = 2;
x = 7;
d = 3;
DiscretePlot[{CohenMoment2[y, x, β], y * x^(1+β) / ((1 + β) Zeta[1 + β]) - x^(2+2β) / (2 (1 + β)^2 (Zeta[1 + β])^2)}, {y, x^(2β), d * x^(2β)}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red], Darker[Green]}]
```



```
β = 3;
x = 3;
d = 2;
DiscretePlot[{CohenMoment2[y, x, β], y * x^(1+β) / ((1 + β) Zeta[1 + β]) - x^(2+2β) / (2 (1 + β)^2 (Zeta[1 + β])^2)}, {y, x^(2β), d * x^(2β)}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red], Darker[Green]}]
```




```
β = 3;
x = 4;
d = 2;
DiscretePlot[{CohenMoment2[y, x, β], y * x^(1+β) / ((1 + β) Zeta[1 + β]) - x^(2+2β) / (2 (1 + β)^2 (Zeta[1 + β])^2)}, {y, x^(2β), d * x^(2β)}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red], Darker[Green]}]
```



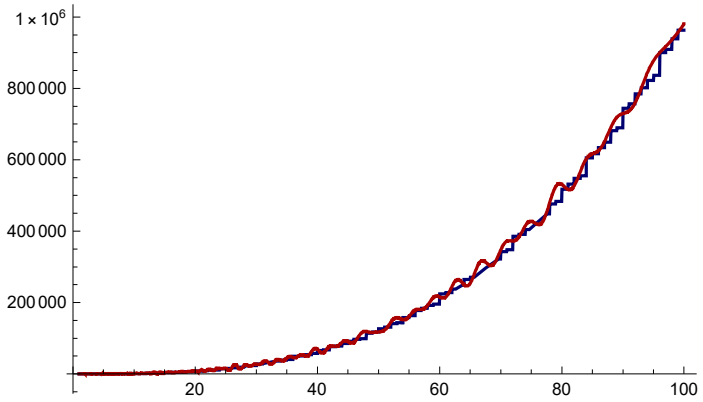

```
4 * 35^2
```

```
4900
```

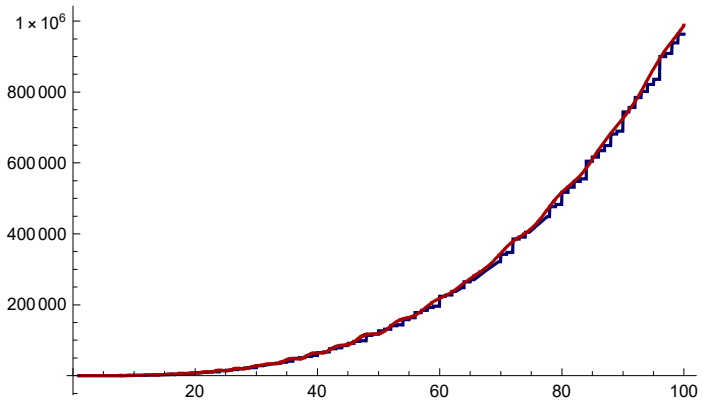
```
β = 1;
x = 35;
d = 4;
DiscretePlot[{CohenMoment2[y, x, β], y * x^(1+β) / ((1 + β) Zeta[1 + β]) - x^(2+2 β) / (2 (1 + β)^2 (Zeta[1 + β])^2)}, {y, x^(2 β), d * x^(2 β)}, Filling → None, PlotStyle → {Darker[Darker[Blue]], Darker[Red], Darker[Green]}]
TimeUsed[]
$Aborted

12 869.8
```

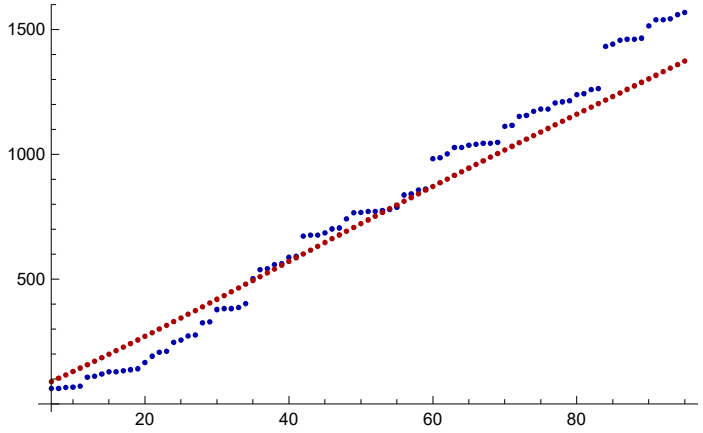
```
Plot[{∑_(n=1)^y DivisorBeta[1, n, 1] DivisorBeta[1, n, 1], 1/24 y - EulerGamma/2 y^2 - 1/192 + 5/6 Zeta[3] y^3 + Explicit2Moment[y, 100]}, {y, 1, 100}, PlotStyle → {Darker[Darker[Blue]], Darker[Red]}]
```



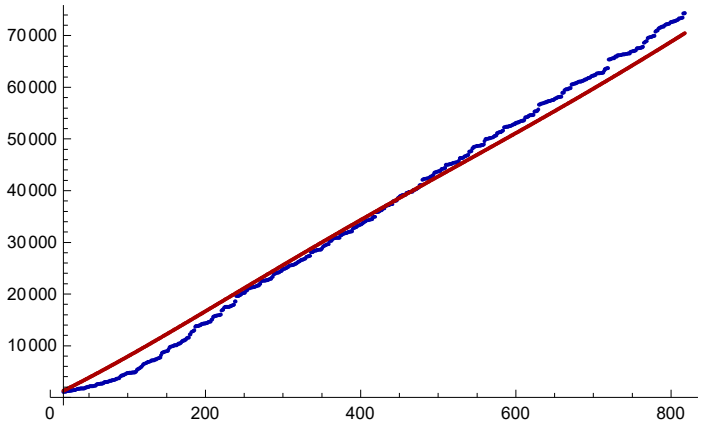
```
Plot[{∑_{n=1}^{y} DivisorBeta[1, n, 1] DivisorBeta[1, n, 1],
  1/24 y - EulerGamma/2 y^2 - 1/192 + 5/6 Zeta[3] y^3 + Explicit2Moment[y, 50]},
 {y, 1, 100}, PlotStyle → {Darker[Darker[Blue]], Darker[Red]}]
```



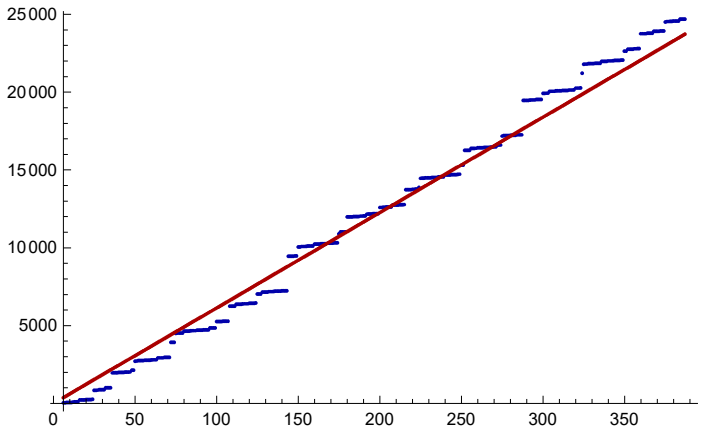

```
x = 7;
β = 1;
B = 1;
DiscretePlot[{CohenMoment2[y, x, β],
  (y * x^(1+β))/((1 + β) Zeta[1 + β]) + (y * x^2)/Zeta[2] NIntegrate[1/(2 π) f[β, i * t] e^(-i*t*y^(1/β)*x^-2), {t, -2, 2}]},
 {y, x, x^(1+β) (Log[x])^B}, Filling → None, PlotStyle → {Darker[Blue], Darker[Red]}]
```



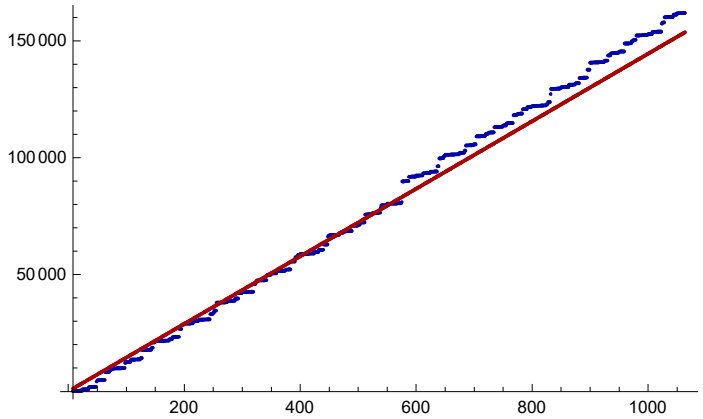
```
x = 17;
β = 1;
B = 1;
DiscretePlot[{CohenMoment2[y, x, β],
 (y * x^(1+β))/((1 + β) Zeta[1 + β]) + (y * x^2)/Zeta[2] Re[NIntegrate[1/(2 π) f[β, i * t] e^(-i*t*y^(1/β)*x^-2), {t, -2, 2}]]},
 {y, x, x^(1+β) (Log[x])^B}, Filling → None, PlotStyle → {Darker[Blue], Darker[Red]}]
```



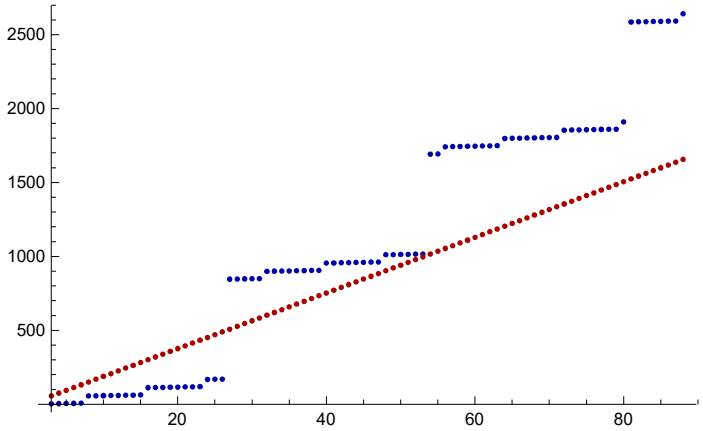

```
x = 6;
β = 2;
B = 1;
DiscretePlot[{CohenMoment2[y, x, β],
 (y * x^(1+β))/((1 + β) Zeta[1 + β]) + (y * x^2)/Zeta[2] Re[NIntegrate[1/(2 π) f[β, i * t] e^(-i*t*y^(1/β)*x^-2), {t, -2, 2}]]},
 {y, x, x^(1+β) (Log[x])^B}, Filling → None, PlotStyle → {Darker[Blue], Darker[Red]}]
```



```
x = 8;
β = 2;
B = 1;
DiscretePlot[{CohenMoment2[y, x, β],
 y * x^(1+β)/((1 + β) Zeta[1 + β]) + y * x^2/Zeta[2] Re[NIntegrate[1/(2 π) f[β, i * t] e^(-i*t*y^(1/β)*x^-2), {t, -2, 2}]]},
 {y, x, x^(1+β) (Log[x])^B}, Filling → None, PlotStyle → {Darker[Blue], Darker[Red]}]
```




```
x = 3;
β = 3;
B = 1;
DiscretePlot[{CohenMoment2[y, x, β],
 y * x^(1+β)/((1 + β) Zeta[1 + β]) + y * x^2/Zeta[2] Re[NIntegrate[1/(2 π) f[β, i * t] e^(-i*t*y^(1/β)*x^-2), {t, -2, 2}]]},
 {y, x, x^(1+β) (Log[x])^B}, Filling → None, PlotStyle → {Darker[Blue], Darker[Red]}]
```



```
x = 4;
β = 3;
B = 1;
DiscretePlot[{CohenMoment2[y, x, β],
  (y * x^(1+β))/((1 + β) Zeta[1 + β]) + (y * x^2)/Zeta[2] Re[NIntegrate[1/(2 π) f[β, i * t] e^(-i*t*y^(1/β)*x^-2), {t, -2, 2}]]},
 {y, x, x^(1+β) (Log[x])^B}, Filling → None, PlotStyle → {Darker[Blue], Darker[Red]}]
```