In[79]:=
```
secondOrderPellNumbers = RecurrenceTable[
   {j[k] == 2 j[k - 1] + j[k - 3], j[0] == 0, j[1] == 0, j[2] == 1}, j, {k, 0, 9000}];
```

In[ ]:=
```
secondOrderPellNumbers;
```

In[48]:=
```
x = 0
```

Out[48]=
```
0
```

In[49]:=
```
Table[x + secondOrderPellNumbers[[n]], {n, 1, 11}]
```

Out[49]=
```
{0, 0, 1, 2, 4, 9, 20, 44, 97, 214, 472}
```

In[50]:=
```
Total[%50]
```

Out[50]=
```
Total[%50]
```

In[42]:=
```
isInteger[x_] := IntegerQ[x]
```

In[43]:=
```
P[n_] := 2 P[n - 1] + P[n - 3]

(*Define the initial values*)
P[0] = 0; P[1] = 0; P[2] = 1;

(*Function to calculate the sum S[n,N]*)
S[n_, K_] := Sum[P[n + i], {i, 0, K - 1}]
```

In[46]:=
```
S[1, 10]
```

Out[46]=
```
863
```

In[47]:=
```
S[1, 10] == Total[%50]
```

Out[47]=
```
863 == Total[%50]
```

In[ ]:=
```
K = 7
```

Out[ ]=
```
7
```

In[52]:=
```
listSequence = Flatten[
   Table[Table[Take[secondOrderPellNumbers, {n, n + 6}], {n, 1, 100}], 1], 1];
```

In[55]:=
```
sumSequence = Total /@ listSequence;
```

In[31]:=
```
divideSequence =
 Quiet@Flatten[Table[If[secondOrderPellNumbers[[k]] < sumSequence[[n]],
     sumSequence[[n]] / secondOrderPellNumbers[[k]], Nothing],
    {n, 1, Length[sumSequence]}, {k, 1, Length[secondOrderPellNumbers]}]]
```

Out[31]=

$$\left\{\text{ComplexInfinity}, \text{ComplexInfinity}, 36, 18, 9, 4, \frac{9}{5}, \text{⋯ 5637 ⋯}, \frac{185\,347\,003\,105\,513\,052\,431\,179\,285\,903\,059\,747}{1\,948\,800\,282\,363\,563\,260\,966\,249\,942\,954\,082}, \frac{370\,694\,006\,211\,026\,104\,862\,358\,571\,806\,119\,494}{8\,596\,428\,657\,474\,227\,573\,630\,588\,652\,523\,657}, \frac{185\,347\,003\,105\,513\,052\,431\,179\,285\,903\,059\,747}{9\,480\,010\,128\,772\,371\,692\,342\,276\,335\,700\,202}, \frac{185\,347\,003\,105\,513\,052\,431\,179\,285\,903\,059\,747}{20\,908\,820\,539\,908\,306\,645\,650\,802\,614\,354\,486}, \frac{370\,694\,006\,211\,026\,104\,862\,358\,571\,806\,119\,494}{92\,231\,710\,817\,107\,454\,156\,233\,799\,109\,941\,601}, \frac{185\,347\,003\,105\,513\,052\,431\,179\,285\,903\,059\,747}{101\,711\,720\,945\,879\,825\,848\,576\,075\,445\,641\,803}\right\}$$

Size in memory: 0.5 MB | + Show more | Show all | Iconize | Store full expression in notebook

In[36]:=
```
integerCheck = IntegerQ /@ divideSequence;
```

In[37]:=
```
Count[integerCheck, True]
```

Out[37]=
```
240
```

In[38]:=
```
positionCheck = Position[integerCheck, True] // Flatten;
```

In[56]:=
```
ListIntgers1 =  Table[divideSequence[[n]], {n, positionCheck}];
```

In[62]:=
```
listSequence2 = Flatten[Table[
    Table[Take[secondOrderPellNumbers, {n + 1, n + 1 + 6}], {n, 1, 100}], 1], 1];
```

In[63]:=
```
sumSequence2 = Total /@ listSequence2;
```

In[64]:=
```
divideSequence2 =
 Quiet@Flatten[Table[If[secondOrderPellNumbers[[k]] < sumSequence2[[n]],
     sumSequence2[[n]] / secondOrderPellNumbers[[k]], Nothing],
    {n, 1, Length[sumSequence2]}, {k, 1, Length[secondOrderPellNumbers]}]]
```

Out[64]=

$$\left\{\text{ComplexInfinity}, \text{ComplexInfinity}, 80, 40, 20, \frac{80}{9}, 4, \text{⋯ 5737 ⋯}, \frac{817\,591\,368\,131\,765\,733\,310\,541\,103\,451\,042\,588}{8\,596\,428\,657\,474\,227\,573\,630\,588\,652\,523\,657}, \frac{204\,397\,842\,032\,941\,433\,327\,635\,275\,862\,760\,647}{4\,740\,005\,064\,386\,185\,846\,171\,138\,167\,850\,101}, \frac{204\,397\,842\,032\,941\,433\,327\,635\,275\,862\,760\,647}{10\,454\,410\,269\,954\,153\,322\,825\,401\,307\,177\,243}, \frac{817\,591\,368\,131\,765\,733\,310\,541\,103\,451\,042\,588}{92\,231\,710\,817\,107\,454\,156\,233\,799\,109\,941\,601}, \frac{408\,795\,684\,065\,882\,866\,655\,270\,551\,725\,521\,294}{101\,711\,720\,945\,879\,825\,848\,576\,075\,445\,641\,803}, \frac{204\,397\,842\,032\,941\,433\,327\,635\,275\,862\,760\,647}{112\,166\,131\,215\,833\,979\,171\,401\,476\,752\,819\,046}\right\}$$

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In[68]:=
```
integerCheck2 = IntegerQ /@ divideSequence2;
```

In[69]:=
```
Count[integerCheck2, True]
```

Out[69]=
```
239
```

In[71]:=
```
positionCheck2 = Position[integerCheck2, True] // Flatten;
```

In[73]:=
```
ListIntgers2 =  Table[divideSequence2[[n]], {n, positionCheck2}];
```

In[77]:=
```
intersection = Intersection[ListIntgers1, ListIntgers2];
```

In[78]:=
```
Length[intersection]
```

Out[78]=
```
236
```