

The next first element of an ordered pair(predicted)

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ConsecutiveSums={5,8,9,8,5,0,-7,-16,-27,-40,-55,-72,-91,-112,-135,-160,-187,-216,-247} can be easily continued by AI Microsoft copilot i asked it to continue for more 100 numbers and the answer was :

The rule that defines this sequence is to add a difference that starts at 3 and alternates signs, increasing by 2 with each term. This logic can be used to continue the sequence indefinitely.

(\* Inicialização da sequência e cálculo das diferenças \*)

```
seq = {5, 8, 9, 8, 5, 0, -7, -16, -27, -40, -55, -72, -91, -112, -135, -160, -187, -216, -247};
```

```
diffs = {3, 1, -1, -3, -5, -7, -9, -11, -13, -15, -17, -19, -21, -23, -25, -27, -29, -31};
```

(\* Estender a sequência para mais 100 termos \*)

```
For[i = 1, i <= 100, i++,  
  AppendTo[diffs, diffs[[-1]] - 2];  
  AppendTo[seq, seq[[-1]] + diffs[[-1]]];  
]
```

```
seq={5, 8, 9, 8, 5, 0, -7, -16, -27, -40, -55, -72, -91, -112, -135, \  
-160, -187, -216, -247, -280, -315, -352, -391, -432, -475, -520, \  
-567, -616, -667, -720, -775, -832, -891, -952, -1015, -1080, -1147, \  
-1216, -1287, -1360, -1435, -1512, -1591, -1672, -1755, -1840, -1927, \  
-2016, -2107, -2200, -2295, -2392, -2491, -2592, -2695, -2800, -2907, \  
-3016, -3127, -3240, -3355, -3472, -3591, -3712, -3835, -3960, -4087, \  
-4216, -4347, -4480, -4615, -4752, -4891, -5032, -5175, -5320, -5467, \  
-5616, -5767, -5920, -6075, -6232, -6391, -6552, -6715, -6880, -7047, \  
-7216, -7387, -7560, -7735, -7912, -8091, -8272, -8455, -8640, -8827, \  
-9016, -9207, -9400, -9595, -9792, -9991, -10192, -10395, -10600, \  
-10807, -11016, -11227, -11440, -11655, -11872, -12091, -12312, \  
-12535, -12760, -12987, -13216, -13447}
```

```
orderedPairs = {{12, 5}, {20, 13}, {26, 19}, {30, 23}, {42, 35}, {44, 37}, {56,  
49}, {86, 79}, {102, 95}, {104, 97}, {110, 103}, {132, 125}, {146, 139},  
{152, 145}, {162, 155}, {174, 167}, {180, 173}, {182, 175}, {186, 179}};  
firstElements = orderedPairs[[All, 1]];  
secondElements = orderedPairs[[All, 2]];  
nextOddNumbers = secondElements + 2  
Range[Length[secondElements]];
```

```
consecutiveSums = Accumulate[firstElements] -  
Accumulate[nextOddNumbers];  
diff = consecutiveSums[[18]] - consecutiveSums[[17]];  
nextOddNumber18 = secondElements[[18]] + 2 * 18;  
firstElement18 = diff + nextOddNumber18
```

182