

# Arithmetic Sequences

All number sequences are generated from the sequence of natural numbers 1, 2, 3....

0, 1, 1, 2, 3, 5 is the Fibonacci Sequence.

It is the sequence of numbers where each term is the sum of the two preceding ones.

It usually starts with 0 and 1. This sequence has many interesting properties and appears in various aspects of mathematics, nature, and art.

In general, sequences are arrangements of numbers or objects.

1, 3, 2, 2, 2. is a sequence where, starting from the third term, each term is the average of all preceding terms.

## **General sequence**

(1) 1, 4, 9 is the sequence of square numbers or perfect squares.

a) What is the 10th term of this sequence?

b) At what position does the number 400 appear in the sequence?

c) Which term comes between 900 and 1000 in this sequence?

d) Can the sum of two terms in this sequence be a term in the same sequence? Give an example and comment on this question

The sequence of square numbers is obtained by squaring natural numbers in order. So, the 10th term will be  $10^2 = 100$ .

Since 400 is the square of 20, we can write it as the 20th term of the sequence.

961 (312) is the only perfect square between 900 and 1000.

The last question of the section leads to Pythagoras' theorem. 9 and 16 are the terms of the sequence. Their sum 25 is also a term of this sequence.

## **Arithmetic sequence**

The sequence that begins with a number and adds a constant number repeatedly is called an arithmetic sequence. The sequence of natural numbers, sequence of odd numbers, sequence of even numbers, sequences with multiples of a number, etc. are arithmetic sequences. The starting number is called the first term and the number that is added repeatedly is called the common difference.

(2) Look at the picture. Squares are arranged in sequence. The squares have a side of 1 cm and are made of small sticks.

Following are the number sequences that can be generated from this picture.

(a) 1, 3, 5, 7 the sequence of number of squares in the terms

(b) 4, 10, 16 the sequence of the number of sticks

(c) 4, 8, 12 perimeters the sequence of

All these sequences are arithmetic sequences. The first sequence is the sequence of odd numbers itself. It starts from 1 and continuously adds 2.

→ The second sequence starts from 4 and adds 4 repeatedly. The third is the sequence of the multiples of 4.

(3)  $\sqrt{5}$ ,  $\sqrt{20}$ ,  $\sqrt{45}$  ... is a sequence.

The same sequence can be viewed in many ways. One of them can be described as follows:

$$= 3\sqrt{5} \dots \sqrt{20} = \sqrt{4 * 5} = 2\sqrt{5} \quad \sqrt{45} = \sqrt{9 * 5}$$

The sequence can be written as  $\sqrt{5}$  ,  $2\sqrt{5}$  ,  $3\sqrt{5}$  ....

This is an arithmetic sequence having the first term  $\sqrt{5}$  and common difference  $\sqrt{5}$  .

## Two terms and positions

The difference between two terms of an arithmetic sequence can be written as the product of the difference of positions and common difference of the sequence. This can be used to solve many problems related to them. A proportion exists between the terms and their positions.

The difference between two terms of an arithmetic sequence is proportional to their position difference. The common difference will be the proportionality constant.

If the tenth term and common difference are known, we can find the fifteenth term by adding five times the common difference to the tenth term.

1) The difference between the 10th term and 13th term of an arithmetic sequence is 20.

(a) What is the difference between the 15th term and 21st term?

(b) If the tenth term is 72, then what is the first term?

→The difference between the two terms of an arithmetic sequence is a multiple of the common difference. Here, the given difference is 3 times the common difference.

The difference between the 15th term and 21st term is six times the common difference.

It is  $2 \times 20 = 40$ , The first term can be found by subtracting 9 times the common difference from the 10th term. It is  $72 - 3 \times 20 = 12$ .

2) The 7th term of an arithmetic sequence is 12 and the 12th term is 7.

(a) What is the common difference?

(b) Find the 19th term of the sequence.

The difference between the 12th term and the 7th term is five times the common difference. Five times the common difference is 7 minus 12, which equals to -5. Therefore, the common difference is -1.

The 19th term can be obtained by adding 7 times the common difference to the 12th term. Thus,  $7 + 7 \times -1 = 0$

3) The 5th term of an arithmetic sequence is 1 and 7th term is 13

(a) What is the common difference?

(b) What is the first term?

(c) Write the sequence.

(d) At what position does the number 35 appear in the sequence?

The difference between the seventh term and fifth term is  $13 - 1 = 12$

That is, two times the common difference is 12

The common difference and the first term are

$$6 = 12$$

The sequence is 1, 7, 13, 19, 25, 31, 37, 43, 49, 55, 61, 67, 73, 79, 85, 91, 97, 103, 109, 115, 121, 127, 133, 139, 145, 151, 157, 163, 169, 175, 181, 187, 193, 199, 205, 211, 217, 223, 229, 235, 241, 247, 253, 259, 265, 271, 277, 283, 289, 295, 301, 307, 313, 319, 325, 331, 337, 343, 349, 355, 361, 367, 373, 379, 385, 391, 397, 403, 409, 415, 421, 427, 433, 439, 445, 451, 457, 463, 469, 475, 481, 487, 493, 499, 505, 511, 517, 523, 529, 535, 541, 547, 553, 559, 565, 571, 577, 583, 589, 595, 601, 607, 613, 619, 625, 631, 637, 643, 649, 655, 661, 667, 673, 679, 685, 691, 697, 703, 709, 715, 721, 727, 733, 739, 745, 751, 757, 763, 769, 775, 781, 787, 793, 799, 805, 811, 817, 823, 829, 835, 841, 847, 853, 859, 865, 871, 877, 883, 889, 895, 901, 907, 913, 919, 925, 931, 937, 943, 949, 955, 961, 967, 973, 979, 985, 991, 997, 1003, 1009, 1015, 1021, 1027, 1033, 1039, 1045, 1051, 1057, 1063, 1069, 1075, 1081, 1087, 1093, 1099, 1105, 1111, 1117, 1123, 1129, 1135, 1141, 1147, 1153, 1159, 1165, 1171, 1177, 1183, 1189, 1195, 1201, 1207, 1213, 1219, 1225, 1231, 1237, 1243, 1249, 1255, 1261, 1267, 1273, 1279, 1285, 1291, 1297, 1303, 1309, 1315, 1321, 1327, 1333, 1339, 1345, 1351, 1357, 1363, 1369, 1375, 1381, 1387, 1393, 1399, 1405, 1411, 1417, 1423, 1429, 1435, 1441, 1447, 1453, 1459, 1465, 1471, 1477, 1483, 1489, 1495, 1501, 1507, 1513, 1519, 1525, 1531, 1537, 1543, 1549, 1555, 1561, 1567, 1573, 1579, 1585, 1591, 1597, 1603, 1609, 1615, 1621, 1627, 1633, 1639, 1645, 1651, 1657, 1663, 1669, 1675, 1681, 1687, 1693, 1699, 1705, 1711, 1717, 1723, 1729, 1735, 1741, 1747, 1753, 1759, 1765, 1771, 1777, 1783, 1789, 1795, 1801, 1807, 1813, 1819, 1825, 1831, 1837, 1843, 1849, 1855, 1861, 1867, 1873, 1879, 1885, 1891, 1897, 1903, 1909, 1915, 1921, 1927, 1933, 1939, 1945, 1951, 1957, 1963, 1969, 1975, 1981, 1987, 1993, 1999, 2005, 2011, 2017, 2023, 2029, 2035, 2041, 2047, 2053, 2059, 2065, 2071, 2077, 2083, 2089, 2095, 2101, 2107, 2113, 2119, 2125, 2131, 2137, 2143, 2149, 2155, 2161, 2167, 2173, 2179, 2185, 2191, 2197, 2203, 2209, 2215, 2221, 2227, 2233, 2239, 2245, 2251, 2257, 2263, 2269, 2275, 2281, 2287, 2293, 2299, 2305, 2311, 2317, 2323, 2329, 2335, 2341, 2347, 2353, 2359, 2365, 2371, 2377, 2383, 2389, 2395, 2401, 2407, 2413, 2419, 2425, 2431, 2437, 2443, 2449, 2455, 2461, 2467, 2473, 2479, 2485, 2491, 2497, 2503, 2509, 2515, 2521, 2527, 2533, 2539, 2545, 2551, 2557, 2563, 2569, 2575, 2581, 2587, 2593, 2599, 2605, 2611, 2617, 2623, 2629, 2635, 2641, 2647, 2653, 2659, 2665, 2671, 2677, 2683, 2689, 2695, 2701, 2707, 2713, 2719, 2725, 2731, 2737, 2743, 2749, 2755, 2761, 2767, 2773, 2779, 2785, 2791, 2797, 2803, 2809, 2815, 2821, 2827, 2833, 2839, 2845, 2851, 2857, 2863, 2869, 2875, 2881, 2887, 2893, 2899, 2905, 2911, 2917, 2923, 2929, 2935, 2941, 2947, 2953, 2959, 2965, 2971, 2977, 2983, 2989, 2995, 3001, 3007, 3013, 3019, 3025, 3031, 3037, 3043, 3049, 3055, 3061, 3067, 3073, 3079, 3085, 3091, 3097, 3103, 3109, 3115, 3121, 3127, 3133, 3139, 3145, 3151, 3157, 3163, 3169, 3175, 3181, 3187, 3193, 3199, 3205, 3211, 3217, 3223, 3229, 3235, 3241, 3247, 3253, 3259, 3265, 3271, 3277, 3283, 3289, 3295, 3301, 3307, 3313, 3319, 3325, 3331, 3337, 3343, 3349, 3355, 3361, 3367, 3373, 3379, 3385, 3391, 3397, 3403, 3409, 3415, 3421, 3427, 3433, 3439, 3445, 3451, 3457, 3463, 3469, 3475, 3481, 3487, 3493, 3499, 3505, 3511, 3517, 3523, 3529, 3535, 3541, 3547, 3553, 3559, 3565, 3571, 3577, 3583, 3589, 3595, 3601, 3607, 3613, 3619, 3625, 3631, 3637, 3643, 3649, 3655, 3661, 3667, 3673, 3679, 3685, 3691, 3697, 3703, 3709, 3715, 3721, 3727, 3733, 3739, 3745, 3751, 3757, 3763, 3769, 3775, 3781, 3787, 3793, 3799, 3805, 3811, 3817, 3823, 3829, 3835, 3841, 3847, 3853, 3859, 3865, 3871, 3877, 3883, 3889, 3895, 3901, 3907, 3913, 3919, 3925, 3931, 3937, 3943, 3949, 3955, 3961, 3967, 3973, 3979, 3985, 3991, 3997, 4003, 4009, 4015, 4021, 4027, 4033, 4039, 4045, 4051, 4057, 4063, 4069, 4075, 4081, 4087, 4093, 4099, 4105, 4111, 4117, 4123, 4129, 4135, 4141, 4147, 4153, 4159, 4165, 4171, 4177, 4183, 4189, 4195, 4201, 4207, 4213, 4219, 4225, 4231, 4237, 4243, 4249, 4255, 4261, 4267, 4273, 4279, 4285, 4291, 4297, 4303, 4309, 4315, 4321, 4327, 4333, 4339, 4345, 4351, 4357, 4363, 4369, 4375, 4381, 4387, 4393, 4399, 4405, 4411, 4417, 4423, 4429, 4435, 4441, 4447, 4453, 4459, 4465, 4471, 4477, 4483, 4489, 4495, 4501, 4507, 4513, 4519, 4525, 4531, 4537, 4543, 4549, 4555, 4561, 4567, 4573, 4579, 4585, 4591, 4597, 4603, 4609, 4615, 4621, 4627, 4633, 4639, 4645, 4651, 4657, 4663, 4669, 4675, 4681, 4687, 4693, 4699, 4705, 4711, 4717, 4723, 4729, 4735, 4741, 4747, 4753, 4759, 4765, 4771, 4777, 4783, 4789, 4795, 4801, 4807, 4813, 4819, 4825, 4831, 4837, 4843, 4849, 4855, 4861, 4867, 4873, 4879, 4885, 4891, 4897, 4903, 4909, 4915, 4921, 4927, 4933, 4939, 4945, 4951, 4957, 4963, 4969, 4975, 4981, 4987, 4993, 4999, 5005, 5011, 5017, 5023, 5029, 5035, 5041, 5047, 5053, 5059, 5065, 5071, 5077, 5083, 5089, 5095, 5101, 5107, 5113, 5119, 5125, 5131, 5137, 5143, 5149, 5155, 5161, 5167, 5173, 5179, 5185, 5191, 5197, 5203, 5209, 5215, 5221, 5227, 5233, 5239, 5245, 5251, 5257, 5263, 5269, 5275, 5281, 5287, 5293, 5299, 5305, 5311, 5317, 5323, 5329, 5335, 5341, 5347, 5353, 5359, 5365, 5371, 5377, 5383, 5389, 5395, 5401, 5407, 5413, 5419, 5425, 5431, 5437, 5443, 5449, 5455, 5461, 5467, 5473, 5479, 5485, 5491, 5497, 5503, 5509, 5515, 5521, 5527, 5533, 5539, 5545, 5551, 5557, 5563, 5569, 5575, 5581, 5587, 5593, 5599, 5605, 5611, 5617, 5623, 5629, 5635, 5641, 5647, 5653, 5659, 5665, 5671, 5677, 5683, 5689, 5695, 5701, 5707, 5713, 5719, 5725, 5731, 5737, 5743, 5749, 5755, 5761, 5767, 5773, 5779, 5785, 5791, 5797, 5803, 5809, 5815, 5821, 5827, 5833, 5839, 5845, 5851, 5857, 5863, 5869, 5875, 5881, 5887, 5893, 5899, 5905, 5911, 5917, 5923, 5929, 5935, 5941, 5947, 5953, 5959, 5965, 5971, 5977, 5983, 5989, 5995, 6001, 6007, 6013, 6019, 6025, 6031, 6037, 6043, 6049, 6055, 6061, 6067, 6073, 6079, 6085, 6091, 6097, 6103, 6109, 6115, 6121, 6127, 6133, 6139, 6145, 6151, 6157, 6163, 6169, 6175, 6181, 6187, 6193, 6199, 6205, 6211, 6217, 6223, 6229, 6235, 6241, 6247, 6253, 6259, 6265, 6271, 6277, 6283, 6289, 6295, 6301, 6307, 6313, 6319, 6325, 6331, 6337, 6343, 6349, 6355, 6361, 6367, 6373, 6379, 6385, 6391, 6397, 6403, 6409, 6415, 6421, 6427, 6433, 6439, 6445, 6451, 6457, 6463, 6469, 6475, 6481, 6487, 6493, 6499, 6505, 6511, 6517, 6523, 6529, 6535, 6541, 6547, 6553, 6559, 6565, 6571, 6577, 6583, 6589, 6595, 6601, 6607, 6613, 6619, 6625, 6631, 6637, 6643, 6649, 6655, 6661, 6667, 6673, 6679, 6685, 6691, 6697, 6703, 6709, 6715, 6721, 6727, 6733, 6739, 6745, 6751, 6757, 6763, 6769, 6775, 6781, 6787, 6793, 6799, 6805, 6811, 6817, 6823, 6829, 6835, 6841, 6847, 6853, 6859, 6865, 6871, 6877, 6883, 6889, 6895, 6901, 6907, 6913, 6919, 6925, 6931, 6937, 6943, 6949, 6955, 6961, 6967, 6973, 6979, 6985, 6991, 6997, 7003, 7009, 7015, 7021, 7027, 7033, 7039, 7045, 7051, 7057, 7063, 7069, 7075, 7081, 7087, 7093, 7099, 7105, 7111, 7117, 7123, 7129, 7135, 7141, 7147, 7153, 7159, 7165, 7171, 7177, 7183, 7189, 7195, 7201, 7207, 7213, 7219, 7225, 7231, 7237, 7243, 7249, 7255, 7261, 7267, 7273, 7279, 7285, 7291, 7297, 7303, 7309, 7315, 7321, 7327, 7333, 7339, 7345, 7351, 7357, 7363, 7369, 7375, 7381, 7387, 7393, 7399, 7405, 7411, 7417, 7423, 7429, 7435, 7441, 7447, 7453, 7459, 7465, 7471, 7477, 7483, 7489, 7495, 7501, 7507, 7513, 7519, 7525, 7531, 7537, 7543, 7549, 7555, 7561, 7567, 7573, 7579, 7585, 7591, 7597, 7603, 7609, 7615, 7621, 7627, 7633, 7639, 7645, 7651, 7657, 7663, 7669, 7675, 7681, 7687, 7693, 7699, 7705, 7711, 7717, 7723, 7729, 7735, 7741, 7747, 7753, 7759, 7765, 7771, 7777, 7783, 7789, 7795, 7801, 7807, 7813, 7819, 7825, 7831, 7837, 7843, 7849, 7855, 7861, 7867, 7873, 7879, 7885, 7891, 7897, 7903, 7909, 7915, 7921, 7927, 7933, 7939, 7945, 7951, 7957, 7963, 7969, 7975, 7981, 7987, 7993, 7999, 8005, 8011, 8017, 8023, 8029, 8035, 8041, 8047, 8053, 8059, 8065, 8071, 8077, 8083, 8089, 8095, 8101, 8107, 8113, 8119, 8125, 8131, 8137, 8143, 8149, 8155, 8161, 8167, 8173, 8179, 8185, 8191, 8197, 8203, 8209, 8215, 8221, 8227, 8233, 8239, 8245, 8251, 8257, 8263, 8269, 8275, 8281, 8287, 8293, 8299, 8305, 8311, 8317, 8323, 8329, 8335, 8341, 8347, 8353, 8359, 8365, 8371, 8377, 8383, 8389, 8395, 8401, 8407, 8413, 8419, 8425, 8431, 8437, 8443, 8449, 8455, 8461, 8467, 8473, 8479, 8485, 8491, 8497, 8503, 8509, 8515, 8521, 8527, 8533, 8539, 8545, 8551, 8557, 8563, 8569, 8575, 8581, 8587, 8593, 8599, 8605, 8611, 8617, 8623, 8629, 8635, 8641, 8647, 8653, 8659, 8665, 8671, 8677, 8683, 8689, 8695, 8701, 8707, 8713, 8719, 8725, 8731, 8737, 8743, 8749, 8755, 8761, 8767, 8773, 8779, 8785, 8791, 8797, 8803, 8809, 8815, 8821, 8827, 8833, 8839, 8845, 8851, 8857, 8863, 8869, 8875, 8881, 8887, 8893, 8899, 8905, 8911, 8917, 8923, 8929, 8935, 8941, 8947, 8953, 8959, 8965, 8971, 8977, 8983, 8989, 8995, 9001, 9007, 9013, 9019, 9025, 9031, 9037, 9043, 9049, 9055, 9061, 9067, 9073, 9079, 9085, 9091, 9097, 9103, 9109, 9115, 9121, 9127, 9133, 9139, 9145, 9151, 9157, 9163, 9169, 9175, 9181, 9187, 9193, 9199, 9205, 9211, 9217, 9223, 9229, 9235, 9241, 9247, 9253, 9259, 9265, 9271, 9277, 9283, 9289, 9295, 9301, 9307, 9313, 9319, 9325, 9331, 9337, 9343, 9349, 9355, 9361, 9367, 9373, 9379, 9385, 9391, 9397, 9403, 9409, 9415, 9421, 9427, 9433, 9439, 9445, 9451, 9457, 9463, 9469, 9475, 9481, 9487, 9493, 9499, 9505, 9511, 9517, 9523, 9529, 9535, 9541, 9547, 9553, 9559, 9565, 9571, 9577, 9583, 9589, 9595, 9601, 9607, 9613, 9619, 9625, 9631, 9637, 9643, 9649, 9655, 9661, 9667, 9673, 9679, 9685, 9691, 9697, 9703, 9709, 9715, 9721, 9727, 9733, 9739, 9745, 9751, 9757, 9763, 9769, 9775, 9781, 9787, 9793, 9799, 9805, 9811, 9817, 9823, 9829, 9835, 9841, 9847, 9853, 9859, 9865, 9871, 9877, 9883, 9889, 9895, 9901, 9907, 9913, 9919, 9925, 9931, 9937, 9943, 9949, 9955, 9961, 9967, 9973, 9979, 9985, 9991, 9997, 10003, 10009, 10015, 10021, 10027, 10033, 10039, 10045, 10051, 10057, 10063, 10069, 10075, 10081, 10087, 10093, 10099, 10105, 10111, 10117, 10123, 10129, 10135, 10141, 10147, 10153, 10159, 10165, 10171, 10177, 10183, 10189, 10195, 10201, 10207, 10213, 10219, 10225, 10231, 10237, 10243, 10249, 10255, 10261, 10267, 10273, 10279, 10285, 10291, 10297, 10303, 10309, 10315, 10321, 10327, 10333, 10339, 10345, 10351, 10357, 10363, 10369, 10375, 10381, 10387, 10393, 10399, 10405, 10411, 10417, 10423, 10429, 10435, 10441, 10447, 10453, 10459, 10465, 10471, 10477, 10483, 10489, 10495, 10501, 10507, 10513, 10519, 10525, 10531, 10537, 10543, 10549, 10555, 10561, 10567, 10573, 10579, 10585, 10591, 10597, 10603, 10609, 10615, 10621, 10627, 10633, 10639, 10645, 10651, 10657, 10663, 10669, 10675, 10681, 10687, 10693, 10699, 10705, 10711, 10717, 10723, 10729, 10735, 10741, 10747, 10753, 10759, 10765, 10771, 10777, 10783, 10789, 10795, 10801, 10807, 10813, 10819, 10825, 10831, 10837, 10843, 10849, 10855, 10861, 10867, 10873, 10879, 10885, 10891, 10897, 10903, 10909, 10915, 10921, 10927, 10933, 10939, 10945, 10951, 10957, 10963, 10969, 10975, 10981, 10987, 10993, 10999, 11005, 11011, 11017, 11023, 11029, 11035, 11041, 11047, 11053, 11059, 11065, 11071, 11077, 11083, 11089, 11095, 11101, 11107, 11113, 11119, 11125, 11131, 11137, 11143, 11149, 11155, 11161, 11167, 11173, 11179, 11185, 11191, 11197, 11203, 11209, 11215, 11221, 11227, 11233, 11239, 11245, 11251, 11257, 11263, 11269, 11275, 11281, 11287, 11293, 11299, 11305, 11311, 11317, 11323, 11329, 11335, 11341, 11347, 11353, 11359, 11365, 11371, 11377, 11383, 11389, 11395, 11401, 11407, 11413, 11419, 11425, 11431, 11437, 11443, 11449, 11455, 11461, 11467, 11473, 11479, 11485, 11491, 11497, 11503, 11509, 11515, 11521, 11527, 11533, 11539, 11545, 11551, 11557, 11563, 11569, 11575, 11581, 11587, 11593, 11599, 11605, 11611, 11

(b) What is the difference between the sum of the first 10 terms and the sum of the next 10 terms?

The difference between the first term and the eleventh term is 10 times the common difference. Thus,  $10 \times 5 = 50$ .

The same difference exists between the second and twelfth terms, and between the third and thirteenth terms, and so on. Finally, we can say that the difference between the tenth term and the twentieth term is 50.

We know that the difference between the sums is equal to the sum of the differences of the terms. So, the answer to the second question is  $10 \times 50 = 500$

### **Pairing of terms and summation**

In an arithmetic sequence, the sum of the two terms, at the same distance behind and ahead a term, is twice this term.

In an arithmetic sequence, the sum of a term and the consecutive terms at the same distance behind and ahead, is the product of this term and the number of terms.

The sum of an odd number of consecutive terms of an arithmetic sequence is the product of the middle term and the number of terms.

In an arithmetic sequence, if one position is increased and another position is decreased by the same amount, the sum of the terms at these positions does not change.

In an arithmetic sequence, if the sum of two positions is equal to the sum of other two positions, then the sum of the terms at each pair is the same.

5) The sum of the first five terms of an arithmetic sequence is 70. The sum of the first eight terms

is also 70.

(a) What is the sum of the sixth, seventh and eighth terms of this sequence?

(b) What is the seventh term of this sequence?

(c) What is the sum of the first 13 terms of this sequence?

The sum of the sixth, seventh and eighth term is  $70-70 = 0$ .

This is the sum of three consecutive terms.

Consider three consecutive terms, 6th, 7th and 8th terms. The seventh term is  $= 0$ . Then, the sum of the sixth and eighth terms is 0. In the first 13 terms, the 7th term is the middle term. So, the sum of the first 13 terms is  $0 \times 13 = 0$

6) The sum of first 9 terms of an arithmetic sequence is 144 and the sum of next 6 terms is 231.

(a) What is the 5th term of the sequence?

(b) What is its 8th term?

(c) What is the common difference of the sequence?

(d) Find the first term and write the sequence. The fifth term is  $144 = 16$ .

The sum of the 9 fifteen terms is  $144 + 231 = 375$ . So, the 8th term is  $375-25$ . The difference 15 between the 5th term and the 8th term is three times the common difference. Three times the common difference is 9. The common difference is 3. The

first term  $= 16-4 \times 3=4$ . The sequence is 4, 7, 10... The algebra of arithmetic sequence will be discussed in the third unit.