

Create the explicit and recursive formulas for each

$-10, -7, -4, -1, 2, 5, 8, 11, 14, 17, 20, 23, 26, 29, 32, 35, 38, 41, 44, 47, 50, 53, 56, 59, 62, 65, 68, 71, 74, 77, 80, 83, 86, 89, 92, 95, 98, 101, 104, 107, 110, 113, 116, 119, 122, 125, 128, 131, 134, 137, 140, 143, 146, 149, 152, 155, 158, 161, 164, 167, 170, 173, 176, 179, 182, 185, 188, 191, 194, 197, 200, 203, 206, 209, 212, 215, 218, 221, 224, 227, 230, 233, 236, 239, 242, 245, 248, 251, 254, 257, 260, 263, 266, 269, 272, 275, 278, 281, 284, 287, 290, 293, 296, 299, 302, 305, 308, 311, 314, 317, 320, 323, 326, 329, 332, 335, 338, 341, 344, 347, 350, 353, 356, 359, 362, 365, 368, 371, 374, 377, 380, 383, 386, 389, 392, 395, 398, 401, 404, 407, 410, 413, 416, 419, 422, 425, 428, 431, 434, 437, 440, 443, 446, 449, 452, 455, 458, 461, 464, 467, 470, 473, 476, 479, 482, 485, 488, 491, 494, 497, 500, 503, 506, 509, 512, 515, 518, 521, 524, 527, 530, 533, 536, 539, 542, 545, 548, 551, 554, 557, 560, 563, 566, 569, 572, 575, 578, 581, 584, 587, 590, 593, 596, 599, 602, 605, 608, 611, 614, 617, 620, 623, 626, 629, 632, 635, 638, 641, 644, 647, 650, 653, 656, 659, 662, 665, 668, 671, 674, 677, 680, 683, 686, 689, 692, 695, 698, 701, 704, 707, 710, 713, 716, 719, 722, 725, 728, 731, 734, 737, 740, 743, 746, 749, 752, 755, 758, 761, 764, 767, 770, 773, 776, 779, 782, 785, 788, 791, 794, 797, 800, 803, 806, 809, 812, 815, 818, 821, 824, 827, 830, 833, 836, 839, 842, 845, 848, 851, 854, 857, 860, 863, 866, 869, 872, 875, 878, 881, 884, 887, 890, 893, 896, 899, 902, 905, 908, 911, 914, 917, 920, 923, 926, 929, 932, 935, 938, 941, 944, 947, 950, 953, 956, 959, 962, 965, 968, 971, 974, 977, 980, 983, 986, 989, 992, 995, 998, 1001$

Recursive
 $A_1 = -7$
 $A_n = A_{n-1} - 3$

Explicit
 $A_n = -7 - 3(n-1)$
 $= -7 - 3n + 3$
 $A_n = -4 - 3n$

$6, 8.5, 11, 13.5, 16, \dots$

Rec
 $A_1 = 8.5$
 $A_n = A_{n-1} + 2.5$

$11 - 8.5 = 2.5 = d$

Explicit
 $A_n = 8.5 + 2.5(n-1)$
 $8.5 + 2.5n - 2.5$
 $A_n = 6 + 2.5n$
OR $2.5n + 6$

What Does It Mean?

A Solidify Understanding Task

Each of the tables below represents an arithmetic sequence.

Find the missing terms in the sequence, showing your method.

$$\frac{y_2 - y_1}{x_2 - x_1} = \underline{\underline{\text{slope}}}$$



1.

x	1	2	3
y	5	8	11

+3 +3

$$\frac{11-5}{3-1} = \frac{6}{2} = +3$$

2.

x	1	2	3	4	5
y	18	11	4	-3	-10

$$\frac{-10-18}{5-1} = \frac{-28}{4} = -7$$

3.

x	1	2	3	4	5	6	7
y	12	9	6	3	0	-3	-6

$$\frac{-6-12}{7-1} = \frac{-18}{6} = -3$$

4. Describe your method for finding the missing terms. Will the method always work? How do you know?

Gress & check ✓
 played w/ calc #'s

Nothing

Here are a few more arithmetic sequences with missing terms. Complete each table, either using the method you developed previously or by finding a new method.

5.

x	1	2	3	4
y	50	62	74	86

$$\frac{86 - 50}{4 - 1} = \frac{36}{3} = 12$$

6.

x	1	2	3	4	5	6
y	40	34	28	22	16	10

$$\frac{10 - 40}{6 - 1} = \frac{-30}{5} = -6$$

7.

x	1	2	3	4	5	6	7	8
y	-23	-19	-15	-11	-7	-3	1	5

$$\frac{5 - (-23)}{8 - 1} = \frac{28}{7} = 4$$

8. The missing terms in an arithmetic sequence are called "arithmetic means". For example, in the problem above, you might say, "Find the 6 arithmetic means between -23 and 5". Describe a method that will work to find arithmetic means and explain why this method works.

$$\frac{\text{last term} - \text{1st term}}{\text{term \#} - \text{term \#}}$$

Create explicit & Recursive

$$a_{14} = 90$$

$$d = 4$$

$$A_1 = 38$$

$$90 = A_1 + 4(14-1)$$

$$90 = A_1 + 52$$

~~-52~~ ~~-52~~

Recursive

$$A_1 = 38$$
$$A_n = A_{n-1} + 4$$

Exp

$$A_n = 38 + 4(n-1)$$

$38 + 4n - 4 \rightarrow A_n = 4n + 34$

$$A_7 = 90$$

$$d = 13.75$$

$$A_{15} = 200$$

$$\frac{200 - 90}{15 - 7} = 13.75$$

$$A_1 = 7.5$$

$$d = 13.75$$

$$90 = A_1 + 13.75(7-1)$$

$$90 = A_1 + 82.5$$

~~-82.5~~ ~~-82.5~~

Recursive

$$A_1 = 7.5 \quad A_n = A_{n-1} + 13.75$$

Exp

$$A_n = 7.5 + 13.75(n-1)$$
$$= 7.5 + 13.75n - 13.75$$

$$A_n = -6.25 + 13.75n$$

Dejuvan \rightarrow \$ 40,000

After 1 yr \rightarrow \$ 48,000

Exp

$$A_n = 40000 + 8000n$$

Recur

$$d = 8000$$

$$A_1 = 48000$$

$$A_n = A_{n-1} + 8000$$

<u>X</u>	<u>Y</u>
0	40000
1	48000
2	56000
3	64000