

Simplify:

$$1. (7 + 8i) - (6 - 5i)$$

$$7 + 8i - 6 + 5i$$

$$1 + 13i$$

$$2. \frac{(6 + 2i)(5 + 3i)}{(5 - 3i)(5 + 3i)} = \frac{30 + 18i + 10i + 6i^2}{25 - 15i + 15i - 9i^2}$$

$$= \frac{30 + 28i - 6}{25 + 9}$$

$$= \frac{24 + 28i}{34} = \frac{12 + 14i}{17}$$

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Arithmetic Sequences

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Arithmetic Sequence



- Each term, after the first is found by adding a common difference
- Example: 4, 6, 8, 10, ...

a_1 → (value of the first term) 4

n → (which term it is) $n=4$ a_4

d → (common difference: $a_n - a_{n-1}$)

$d =$ any term minus the previous term

$$8 - 6 = 2 = d$$

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Is the following arithmetic? If so, find the common difference.



- -4, -1, 2, 5, 8, ... yes $d=3$
- 7, 3, -1, -5, -9, ... yes $d=-4$
- 3, 6, 12, 24, ... no
- 3, 8 not enough info.

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Use the recursive formula given to find the first four terms of the arithmetic sequence given.

$$t_1 = 7$$

$$t_n = t_{n-1} - 3$$

$$t_2 = t_1 - 3 = 7 - 3 = 4$$

$$t_3 = 4 - 3 = 1$$

$$t_4 = 1 - 3 = -2$$

$$7, 4, 1, -2$$



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Use the recursive formula given to find the first four terms of the arithmetic sequence given.

$$t_1 = -2$$

$$t_n = t_{n-1} + 6$$

$$t_1 = -2$$

$$t_2 = -2 + 6 = 4$$

$$t_3 = 4 + 6 = 10$$

$$t_4 = 10 + 6 = 16$$

$$-2, 4, 10, 16$$



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List the first three terms of the arithmetic sequence below:

$$t_n = 2n - 3$$

$$t_1 = 2(1) - 3 = -1$$

$$t_2 = 2(2) - 3 = 1$$

$$t_3 = 2(3) - 3 = 3$$

$$t_4 = 2(4) - 3 = 5$$

explicit b/c
plugging term #
(n)

-1, 1, 3, 5

Recursive:

$$t_n = t_{n-1} + 2$$



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List the first three terms of the arithmetic sequence below:

$$t_n = 5 + (n - 1)(3)$$

5, 8, 11, 14

Recursive:

$$t_n = t_{n-1} + 3$$



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Let's figure out the explicit formula!



1st term: t_1

2nd term: $t_1 + d$

3rd term: $(t_1 + d) + d = t_1 + 2d$

4th term: $t_1 + 2d + d = t_1 + 3d$

10th term: $t_1 + 9d$

n th term: $t_1 + (n-1)d$

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Write an explicit formula for the n th term of the arithmetic sequence below:



12, 15, 18, 21, 24, ...

$$t_1 = 12$$

$$d = 3$$

Recursive:

$$t_n = t_{n-1} + 3$$

Explicit:

$$t_n = t_1 + (n-1)d$$

$$t_n = 12 + (n-1)3$$

$$t_n = 12 + 3n - 3$$

$$t_n = 9 + 3n$$

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Write an explicit formula for the n th term of the arithmetic sequence below:

4, 1, -2, -5, -8, ...

explicit:

$$t_n = 7 - 3n$$

$$= -3n + 7$$

Rec:

$$t_n = t_{n-1} - 3$$



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Write an explicit formula for the n th term of the arithmetic sequence below:

-14, -11, -8, -5,

$$t_n = -14 + (n-1)3$$

$$t_n = -14 + 3n - 3$$

$$t_n = -17 + 3n$$

$$t_n = -17 + 3n$$

$$t_n = t_{n-1} + 3$$



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Find the nth given the other two terms.

$$t_3 = 22 \quad \text{and} \quad t_6 = 34$$

$$34 - 22 = 12 \quad \frac{12}{3} = 4 = d$$

$$6 - 3 = 3$$

$$t_1 = 14 \quad t_n = 14 + (n-1)4$$

$$t_n = 10 + 4n$$



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Find the 5th given the other two terms.

$$t_3 = 26 \quad \text{and} \quad t_7 = 54 \quad \begin{array}{l} 54 - 26 = 28 \\ 7 - 3 = 4 \end{array}$$

$$d = 7$$

$$t_5 = 40$$



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Find the 8th given the other two terms.

$$t_5 = 22 \quad \text{and} \quad t_{12} = 50$$

$$t_8 = 34$$



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Find the 5th given the other two terms.

$$t_4 = 144 \quad \text{and} \quad t_{12} = 112$$

$$t_5 = 140$$

$$\frac{112 - 144}{12 - 4} = \frac{-32}{8} = -4$$



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Homework



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