Bell Work:

To train for a 10-km race ten weeks from now, you plan to being running 4 km each day for a week. Each week after that you increase your distance by a fixed amount. How many kilometers should you add each week to complete your chart?

week 1
4 km

Arithmetic Sequences

Determine whether each sequence is arithmetic. If so, identify the common difference. (d)

1). 2, 3, 5, 8, …

No

2). 0.9, 0.5, 0.1, −0.3, …

Yes

$d = -0.4$

3). 14, −15, −44, −73, …

Yes

$d = -29$

Recursive Formula $a_n = a_{n-1} + d \; ; n > 1$

Explicit Formula = $a_n = a_1 + (n-1)d \; ; \; n \geq 1$

a_1 = 1st term in sequence

n = term #

a_{n-1} = previous term

d = common difference

Find the 43rd term of each sequence.

n

4) 12, 14, 16, 18, ... d=

$a_{43} = 12 + (42)2$

$= 12 + 84$

$a_{43} = 96$

5) 19.5, 19.9, 20.3, 20.7, ...

$a_{43} = 19.5 + (42)(.4)$

$19.5 + 16.8$

$a_{43} = 36.3$

6) 45, 48, 51, 54, ...

$a_{43} = 45 + (42)(3)$

$45 + 126$

$a_{43} = 171$

Find the missing term of each arithmetic sequence.

7) … 14, ■, 15, …

14.5

8) … −5, ■, −2, …

-3.5

$\frac{-5+-2}{2}$

9) −2, ■, 456, …

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A teacher donates the same amount of money each year to help protect the rainforest. At the end of the second year, she has donated enough money to protect 8 acres. At the end of the third year, she has donated enough money to protect 12 acres. How many acres will the teacher's donations protect at the end of the tenth year?

$a_1 = 4$

$a_2 = 8$

$a_3 = 12$

$d = 4 \quad n = 10$

$a_{10} = 4 + (9)(4)$

$a_{10} = 40$ acres

Write an explicit and a recursive formula for each sequence.

a_1

2, 4, 6, 8, 10, ... $n = ?$ $d = 2$

$a_n = 2 + (n-1)\,2$

$a_n = a_{n-1} + 2$

$0, \frac{1}{8}, \frac{1}{4}, \frac{3}{8}, \ldots$

$a_n = 0 + (n-1)\,\frac{1}{8}$

$a_n = a_{n-1} + \frac{1}{8}$

Find the arithmetic mean a_n of the given terms.

$a_{n-1} = 17, a_{n+1} = 3$

a_{n-1}, a_n, a_{n+1}

$17, \underline{10}, 3$

$a_{n-1} = -0.6, a_{n+1} = 3.8$

$-0.6, \underline{1.6}, 3.8$