Key

Math 1

Name _____

Date _____

2-2 Practice 3

Arithmetic Sequences

- I can convert a sequence into a recursive or explicit formula.
- I can use a formula to find missing terms in a sequence.
- I can determine the common difference/ratio from a sequence.

Directions – Determine the desired term.

1. Which term of -14, -4, 6,…is 126?

$126 = -14 + (n-1)(10)$

$+14 \quad +14$

$\frac{140}{10} = \frac{(n-1)10}{10}$

$14 = n-1$ → $n = 15$ 15th term

2. Which term of 23, 33, 43,…is 123?

$123 = 23 + (n-1)10$

$100 = (n-1)10$

$10 = n-1$ → $n = 11$ 11th term

3. Which term of -38, -47, -56,…is -245?

$-245 = -38 + (n-1)(-9)$

$-207 = (n-1)(-9)$

$23 = n-1$ → $n = 24$ 24th term

4. Which term of 4, 204, 404,…is 3804?

$3804 = 4 + (n-1)\cdot 200$

$3800 = (n-1)200$

$19 = n-1$ → $n = 20$ 20th term

5. Which term of -31, 169, 369,…is 2569?

$2569 = -31 + (n-1)200$

$2600 = (n-1)200$

$13 = n-1$ → $n = 14$ 14th term

6. Which term of 26, 19, 12,…is -30?

$-30 = 26 + (n-1)(-7)$

$-56 = (n-1)(-7)$

$8 = n-1$ → $n = 9$ 9th term

7. Which term of 6, 36, 66,…is 276?

$276 = 6 + (n-1)30$

$270 = (n-1)30$

$9 = n-1$ → $n = 10$ 10th term

Directions – Find the missing terms of the following arithmetic sequences.

8. -33, -53, -73, -93, -113

$-33 + 4d = -113$

$4d = -80$

$d = -20$

9. 11, 8, 5, 2, -1, -4

$11 + 5d = -4$

$5d = -15$

$d = -3$

10. 38, 40, 42, 44, 46, 48, 50

$38 + 6d = 50$

$6d = 12$

$d = 2$

11. -21, -26, -31, -36, -41, -46

$-21 + 5d = -46$

$5d = -25$

$d = -5$

12. -6, -14, -22, -30, -38

$-6 + 4d = -38$

$4d = -32$

$d = -8$

13. -1, 4.25, 9.5, 14.75, 20, 25.25, 30.5, 35.75, 41

$-1 + 8d = 41$

$8d = 42$

$d = 5.25$

Write out the first three terms of the following arithmetic sequences; then write an explicit and recursive formula.

	Explicit	Recursive
14. $a_1 = -3.4,\ d = 5.3$	$a_n = -3.4 + (n-1)5.3$	$\begin{cases} a_1 = -3.4 \\ a_n = a_{n-1} + 5.3 \end{cases}$

$-3.4,\ 1.9,\ 7.2$

Find the indicated term in each arithmetic sequence:

15. a_5 for -1, -7, -13, . . .

$a_5 = -1 + (5-1)(-6)$

$a_5 = -1 - 24$

$\boxed{a_5 = -25}$

16. a_{23} for 25, 73.1, 121.2, . . .

$a_{23} = 25 + (23-1)\,48.1$

$= 25 + 1058.2$

$\boxed{a_{23} = 1083.2}$

17. Find the average rate of change from $x = 2$ to $x = 5$

x	y
1	2.5
2	23.3
3	17.6
5	19.5

$\frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{19.5 - 23.3}{5 - 2} = \frac{-3.8}{3}$

$= \boxed{-1.2\overline{6}}$

18. Find the next three terms in the sequence below.

$\{-76.2, -98.9, -121.6, \underline{-144.3}, \underline{-167}, \underline{-189.7}\}$

-22.7

19. Given the recursive or explicit equation, find the first three terms in each sequence below.

a. $\begin{cases} t_1 = 98 \\ t_n = t_{n-1} + 14 \end{cases}$ $\underline{98}, \underline{112}, \underline{126}$

b. $p_n = 184 + (n-1)(-30)$ $\underline{184}, \underline{154}, \underline{124}$

p_1 d

20. Solve the following:

$2\left(\frac{5}{2}(x+3) - (3x-7) = 6\right)$

$5(x-3) - 2(3x-7) = 12$

$5x + 15 - 6x + 14 = 12$

$-x + 29 = 12$

$-29 \quad -29$

$-x = -17$

$\boxed{x = 17}$

~~$-1x - 1 = 12$~~

~~$-1x$~~

~~$-11x = 13$~~

~~$x = \frac{13}{-11} \approx \boxed{1.182}$~~