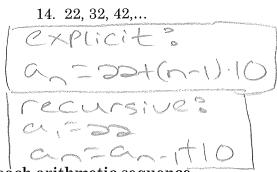**Algebra 2 ~ *Arithmetic Sequences Day 2 HW (3)***   Name: <u>Key 2015-16</u> Hr___

1. What is a common difference?

A number that is added or subtracted to find new terms in an arithmetic sequence.

2. What the explicit formula to find the nth term of an arithmetic sequence?

$$a_n = a_1 + (n-1) \cdot d$$

For #3 & 4, name the first five terms of the arithmetic sequence described.

3. $a_1 = 4$, $d = 3$

$$4, 7, 10, 13, 16$$
$$a_1 \ a_2 \ a_3 \ a_4 \ a_5$$

4. $a_1 = 7$, $d = 5$

$$7, 12, 17, 22, 27$$
$$a_1 \ a_2 \ a_3 \ a_4 \ a_5$$

For #5 & 6, name the next four terms of each arithmetic sequence.

5. 5, 9, 13, ... $d = 4$

$$17, 21, 25, 29$$

6. 21, 15, 9, ... $d = -6$

$$3, -3, -9, -15$$

For #7-8, find the indicated term in each arithmetic sequence:

7. a_{21} for 10, 7, 4, ... $d = -3$

$$a_{21} = 10 + (21-1) \cdot -3$$

$$\boxed{= -50}$$

8. a_{10} for 8, 3, -2, ... $d = -5$

$$a_{10} = 8 + (10-1) \cdot -5$$

$$\boxed{= -37}$$

For #9-12, find the missing terms in each arithmetic sequence:

9. 55, <u>70</u>, <u>85</u>, <u>100</u>, 115

$$d = \frac{115 - 55}{4}$$

$$= 15$$

10. <u>-13</u>, -6, <u>1</u>, <u>8</u>, 15, <u>22</u>

$$d = \frac{15 - -6}{3}$$

$$= 7$$

11. -8, <u>$\frac{-13}{3}$</u>, <u>$\frac{-2}{3}$</u>, 3

$$d = \frac{3 - -8}{3}$$

$$= \frac{11}{3}$$

12. 16, <u>12</u>, <u>8</u>, <u>4</u>, 0
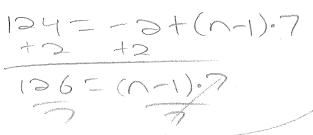
$$d = \frac{0 - 16}{4}$$

$$= -4$$

For #13-14, write an explicit & recursive formula for the nth term of each arithmetic sequence.

13. 2, -1, -4, -7,...

explicit:
$$a_n = 2 + (n-1) \cdot -3$$
Recursive:
$$a_1 = 2$$
$$a_n = a_{n-1} - 3$$

14. 22, 32, 42,...

explicit:
$$a_n = 22 + (n-1) \cdot 10$$
recursive:
$$a_1 = 22$$
$$a_n = a_{n-1} + 10$$

For #15-17, complete the statement for each arithmetic sequence.

15. 124 is the **?** term of -2, 5, 12,...

☆ use $a_n = a_1 + (n-1) \cdot d$

$$124 = -2 + (n-1) \cdot 7$$
$$ +2 \qquad +2$$
$$\overline{\frac{126}{7} = \frac{(n-1) \cdot 7}{7}}$$

$$18 = n-1$$
$$\boxed{19 = n} \ ☆ \ \text{19th term}$$

16. 142 is the **?** term of -3, 2, 7, ...

$$142 = -3 + (n-1) \cdot 5$$
$$+3 \qquad +3$$
$$\overline{\frac{145}{5} = \frac{(n-1) \cdot 5}{5}}$$

$$29 = n-1$$
$$\boxed{30 = n} \ ☆ \ \text{30th term}$$

17. -28 is the **?** term of 7, 2, -3, ...

$$-28 = 7 + (n-1) \cdot -5$$
$$-7 \qquad -7$$
$$\overline{\frac{-35}{-5} = \frac{(n-1) \cdot -5}{-5}}$$

$$7 = n-1$$
$$\boxed{8 = n} \ ☆ \ \text{8th term}$$

For #18 & 19 find the first term (a_1) for the following arithmetic sequences.

18. $a_{12} = 27, d = -5$

$$a_n = a_1 + (n-1) \cdot d$$
$$27 = a_1 + (12-1) \cdot -5$$
$$27 = a_1 - 55$$
$$+55 \qquad +55$$
$$\boxed{82 = a_1}$$

19. $a_{31} = -11, d = 2$

$$a_{31} = a_1 + (n-1) \cdot d$$
$$-11 = a_1 + (31-1) \cdot 2$$
$$-11 = a_1 + 60$$
$$-60 \qquad -60$$
$$\boxed{-71 = a_1}$$