

corrections on #18, 26 pg 1

Kuta Software - Infinite Algebra 2

Name Key #20 pg 4

Arithmetic Sequences

Date _____ Period _____

Determine if the sequence is arithmetic. If it is, find the common difference.

1) 35, 32, 29, 26, ...

-3

2) $-3, -23, -43, -63, \dots$

-20

3) $-34, -64, -94, -124, \dots$

-30

4) $-30, -40, -50, -60, \dots$

-10

5) $-7, -9, -11, -13, \dots$

-2

6) $9, 14, 19, 24, \dots$

5

Given the explicit formula for an arithmetic sequence find the first five terms and the term named in the problem.

7) $a_n = -11 + 7n$

Find a_{34}

~~41~~ $-4, 3, 10, 17, 24$

$a_{34} = 227$

8) $a_n = 65 - 100n$

Find a_{39}

$-35, -135, -235, -335, -435$

$a_{39} = -3835$

9) $a_n = -7.1 - 2.1n$

Find a_{27}

$9.2, 11.3, 13.4, 15.5, 17.6$

$a_{27} = -63.8$

10) $a_n = \frac{11}{8} + \frac{4}{8}n$

Find a_{23}

$\frac{15}{8}, \frac{19}{8}, \frac{23}{8}, \frac{27}{8}, \frac{31}{8}$

$a_{23} = 103/8$

Given the first term and the common difference of an arithmetic sequence find the first five terms and the explicit formula.

11) $a_1 = 28, d = 10$

$28, 38, 48, 58, 68$

$a_n = 28 + 10(n-1)$

12) $a_1 = -38, d = -100$

$-38, -138, -238, -338, -438$

$a_n = -38 - 100(n-1)$

13) $a_1 = -34, d = -10$

$-34, -44, -54, -64, -74$

$a_n = -34 - 10(n-1)$

14) $a_1 = 35, d = 4$

$35, 39, 43, 47, 51$

$a_n = 35 + 4(n-1)$

Given a term in an arithmetic sequence and the common difference find the first five terms and the explicit formula.

15) $a_{38} = -53.2, d = -1.1$
 $-12.5, -13.6, -14.7, -15.8, -16.9$
 $a_n = -12.5 - 1.1(n-1)$

17) $a_{37} = 249, d = 8$
 $-39, -31, -23, -15, -7$
 $a_n = -39 + 8(n-1)$

16) $a_{40} = -1191, d = -30$
 $-21, -51, -81, -111, -141$
 $a_n = -21 - 30(n-1)$

18) $a_{36} = -276, d = -7$
 ~~-24~~ , $-31, -38, -45, -52, -59$
 $a_n = -31 - 7(n-1)$

Given the first term and the common difference of an arithmetic sequence find the recursive formula and the three terms in the sequence after the last one given.

19) $a_1 = \frac{9}{15}, d = -\frac{1}{15}$
 $\frac{4}{15}, -\frac{1}{15}, -\frac{6}{15}$
 $a_n = \frac{3}{5} - \frac{1}{3}(n-1)$

21) $a_1 = -26, d = 200$
 $-26, 174, 374$
 $a_n = -26 + 200(n-1)$

20) $a_1 = 39, d = -5$
 $34, 29, 24$
 $a_n = 39 - 5(n-1)$

22) $a_1 = -9.2, d = 0.9$
 $-8.3, -7.4, -6.5$
 $a_n = -9.2 + 0.9(n-1)$

Given a term in an arithmetic sequence and the common difference find the recursive formula and the three terms in the sequence after the last one given.

23) $a_{21} = -1.4, d = 0.6$
 $a_{22} = -0.8; -0.2, 0.4$
 $a_n = -13.4 + 0.6(n-1)$

25) $a_{18} = 27.4, d = 1.1$
 $a_{19} = 28.5; 29.6, 30.7$
 $a_n = 8.7 + 1.1(n-1)$

24) $a_{22} = -44, d = -2$
 $a_{23} = -46; -48, -50$
 $a_n = -2 - 2(n-1)$

26) $a_{12} = 28.6, d = 1.8$
 $a_{13} = 30.4; 32.2, 34.0$
 ~~$a_n = 8.8 + 1.8(n-1)$~~
 $a_n = 8.8 + 1.8(n-1)$

Given two terms in an arithmetic sequence find the recursive formula.

27) $a_{18} = 3362$ and $a_{38} = 7362$
 $a_n = -38 + 200(n-1)$

28) $a_{18} = 44.3$ and $a_{33} = 84.8$
 $a_n = -1.6 + 2.7(n-1)$

Name: _____

Period: _____

Arithmetic Sequences Worksheet #2

1) For the arithmetic sequence 42, 32, 22, 12...

a. Find the 5th, 6th, and 7th terms

$$a_5 = 2 \quad a_6 = -8, \quad a_7 = -18$$

b. Find the formula for the n th term.

$$a_n = 42 - 10(n-1)$$

c. Find the 18th term in the sequence.

$$a_{18} = -128$$

2) Luke collects comic books. Luke found a favorite comic book shop today. He decided to buy new issues every week, but because he's on a budget, he limits himself to the same amount of books weekly. This is his collection so far:

Week	Number of Comic Books
1	245
2	248
3	251

a. Find how many comic books will Luke have next week?

$$254$$

b. Write an equation to represent the n th week.

$$w_n = 245 + 3(n-1)$$

c. How many comic books will he have in 11 weeks?

$$275$$

d. How many stamps will Luke have in 3 years?

not enough information
he will have 710 comics in 3 years

3) An arithmetic sequence is as follows: 2, 24, 46...

a. Find the 4th, 5th, and 6th terms

$$a_4 = 68, a_5 = 90, a_6 = 112$$

b. Find the formula for the n th term.

$$a_n = 2 + 22(n-1)$$

c. Find the 35th term in the sequence.

$$a_{35} = 750$$

4) A bouncy ball is dropped from a platform during an experiment. During the first second, the bouncy ball falls 2.5 cm. During the 2nd second, it falls 5 cm. During the third second, it falls 7.5.

a. If this pattern continues, how far will the object fall during the 5th second?

$$a_1 = 2.5 \quad d = 2.5$$

$$a_n = 2.5 + 2.5(n-1) \rightarrow a_5 = 12.5 \text{ cm}$$

b. If the platform the ball is on is 200 cm high, find the time (in seconds) when the ball hits the ground.

$$200 = 2.5 + 2.5(n-1) \Rightarrow n = \underline{80 \text{ seconds}}$$

5) What term is 136 in the arithmetic sequence 3, 10, 17... ?

$$a_n = 3 + 7(n-1)$$

$$136 = 3 + 7(n-1) \Rightarrow n = \underline{\underline{20}}$$



Name the first five terms of each arithmetic sequence described.

1. $f(1) = 4, d = 3$
2. $f(1) = 7, d = 5$
3. $f(1) = 16, d = -2$
4. $f(1) = 38, d = -4$
5. $f(1) = \frac{3}{4}, d = -\frac{1}{4}$

1. 4, 7, 10, 13, 16
2. 7, 12, 17, 22, 27
3. 16, 14, 12, 10, 8
4. 38, 34, 30, 26, 22
5. $\frac{3}{4}, \frac{2}{4}, \frac{1}{4}, 0, -\frac{1}{4}$

Name the next four terms of each arithmetic sequence.

6. $5, 9, 13, \dots$
7. $2, -3, -8, \dots$
8. $21, 15, 9, \dots$
9. $\frac{1}{2}, \frac{3}{2}, \frac{5}{2}, \dots$

6. 17, 21, 25, 29
7. -13, -18, -23, -28
8. 3, -3, -9, -15
9. $\frac{7}{2}, \frac{9}{2}, \frac{11}{2}, \frac{13}{2}$

Find the n^{th} term of each arithmetic sequence.

10. $f(1) = -1, d = -10, n = 25$
11. $f(1) = -3, d = -9, n = 11$
12. $f(1) = -7, d = 3, n = 17$
13. $f(1) = 2, d = \frac{1}{2}, n = 8$

10. -241
11. -93
12. 41
13. $11\frac{1}{2}$

Complete each statement.

14. 124 is the _____th term of $-2, 5, 12, \dots$
15. -28 is the _____th term of $7, 2, -3, \dots$
16. $-\frac{17}{4}$ is the _____th term of $2\frac{1}{4}, 2, 1\frac{3}{4}, \dots$

14. 19^{th}
15. 8^{th}
16. 27^{th}

$$a_n = 2.25 - 0.25(n-1)$$



Arithmetic Sequence Practice

Name _____

Find the indicated term in each arithmetic sequence.

17. $f(12)$ for $-17, -13, -9, \dots$

17. 27

18. $f(21)$ for $10, 7, 4, \dots$

18. -50

19. $f(32)$ for $4, 7, 10, 13, \dots$

19. 97

20. $f(10)$ for $8, 3, -2, \dots$

20. ~~42~~ -37

Find the missing terms in each arithmetic sequence.

21. $55, \underline{70}, \underline{85}, \underline{100}, 115$

21. _____

22. $-10, \underline{-7}, \underline{-4}, \underline{-1}, 2$

22. _____

23. $\underline{-13}, -6, \underline{1}, \underline{8}, 15, \underline{22}$

23. _____

24. $\underline{56}, 49, \underline{42}, \underline{35}, 28$

24. _____

25. The last term of an arithmetic sequence is 207, the common difference is 3, and the number of terms is 14. What is the first term?

25. 168

$a_{14} = 207$ $d = 3$
 $a_1 = 168$

26. The third term of an arithmetic sequence is 14 and the ninth term is -1. Find the first four terms of the sequence.

26. ~~18.5~~
19, 16.5, 14, 11.5

$a_3 = 14$ $a_9 = -1$ $d = -2.5$

27. During a free fall, a skydiver falls 16 feet in the first second, 48 feet in the 2nd second, and 80 feet in the third second. If she continues to fall at this rate, how many feet will she fall during the 8th second?

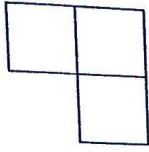
27. 240 feet.

$16, 48, 80$
 $1, 2, 3$ $a_n = 16 + 32(n-1)$

Sequences from patterns

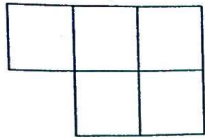
1. Here is a pattern of squares

Pattern 1



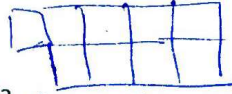
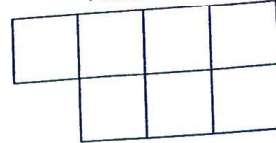
3

Pattern 2



5

Pattern 3



- Draw pattern 4
- How many squares will there be in pattern number 13?
- Which pattern has 27 squares? 13

→ 27

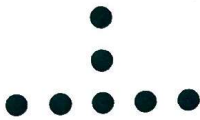
2. Here is a pattern of dots

Pattern 1



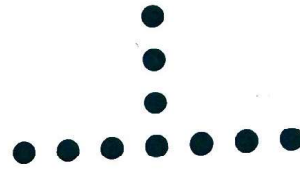
4

Pattern 2



7

Pattern 3



10

- Draw pattern 4
- How many dots will there be in pattern 15? 46
- Jack says there are 70 dots in pattern 20. Is he right? You must explain your answer.

$a_n = 4 + 3(n-1) = 61$ not correct

3. Here is a made from bricks

Pattern 1



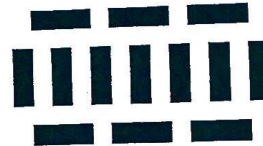
5

Pattern 2



9

Pattern 3



13

- Draw pattern 4
- How many bricks will there be in pattern number 8? 33
- Which pattern will have 49 bricks? 12th
- How many bricks will there be in pattern n?

$5 + 4(n-1)$

4. Here is a made from white and grey tiles.

Pattern 1



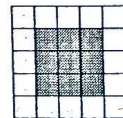
8w
1g

Pattern 2



12w
4g

Pattern 3



16w
9g

- Draw pattern 4
- How many white tiles will there be in pattern number 10? 44
- How many grey tiles will there be in pattern 8? 64
- Miles has 49 grey tiles and 32 white tiles. Which pattern can he make? # 7
- Emma has 90 grey tiles and 42 white tiles. She says she can make pattern number 10. She is incorrect, explain why.
- How many more grey and white tiles will Emma need to make pattern number 10.

$w_n = 8 + 4(n-1)$
 $g_n = n^2$

10 more grey
2 more white.

she needs
100 grey tiles