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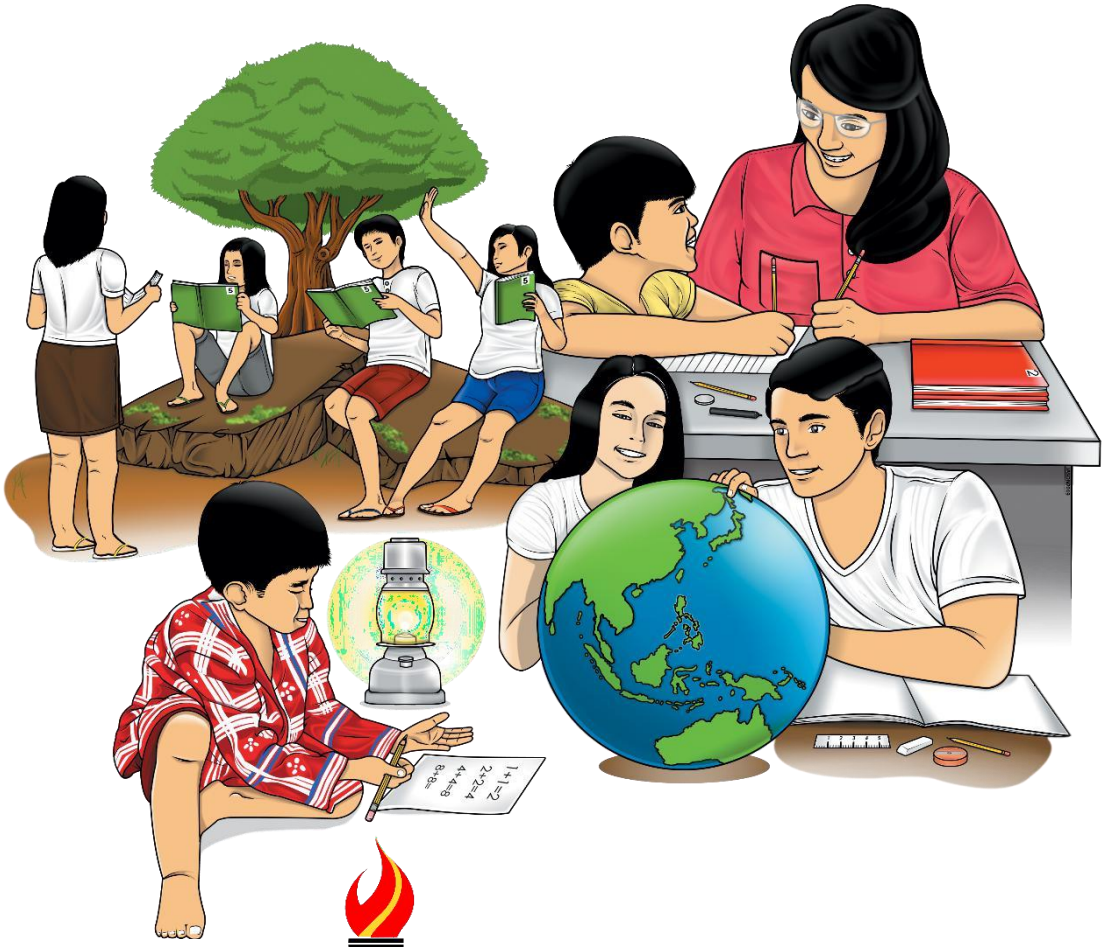
Mathematics

Quarter 1 - Module 3: Arithmetic Means and n^{th} Term of an Arithmetic Sequence



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Mathematics

Quarter I - Module 3: Arithmetic Means and n^{th} Term of an Arithmetic Sequence

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Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

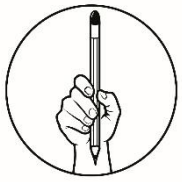
Thank you.

What I Need to Know

This module was designed and written with you in mind. This will help you determine arithmetic means and n^{th} term of an arithmetic sequence. The scope of this module will be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course but how you read and answer this module is dependent on your ability.

After going through this module, you are expected to be able to demonstrate knowledge and skill related to sequence and apply these in solving problems. Specifically, you should be able to:

1. write a formula for the n^{th} term of an arithmetic sequence,
2. find the n^{th} term or unknown term of an arithmetic sequence,
3. define arithmetic means,
4. determine arithmetic means of a sequence and
5. solves problems involving n^{th} term of an arithmetic sequence.



What I Know

Find out how much you already know about the topics in this module. Choose the letter of your answer from the given options. Write your answer on a separate sheet of paper.

1. Which term of the arithmetic sequence 7, 10, 13, 16, . . . is 304?
   a. 99th term b. 100th term c. 111th term d. 102th term

2. Find the nth term of the arithmetic sequence given the following conditions:
   a_1=2 d= 3 n=9
   a. 26 b. 27 c. 28 d. 29

3. Which term of the arithmetic sequence 2, 6, 10,..... is 102?
   a. 20th term b. 26th term c. 30th term d. 35th term

4. If three arithmetic means are inserted between -15 and 9, find the first of these arithmetic means.
   a. 3 b. -3 c. -6 d. -9

5. Find the 21st term of the arithmetic sequence 6, 9, 12, 15,...
   a. 61 b. 60 c. 62 d. 66

6. If three arithmetic means are inserted between 8 and 16, find the second arithmetic mean.
   a. 10 b. 12 c. 14 d. 16

7. Which term of the arithmetic sequence 3, $\frac{7}{3}$, $\frac{5}{3}$, …, … is -27?
   a. 9th term b. 20th term c. 41th term d. 46th term

8. What is the arithmetic mean between 10 and 24?
   a. 18.5 b. 19 c. 16 d. 17

9. What is the 10th term of the following arithmetic sequence: -5, -1, 3, 7, 11,…?
   a. 31 b. 19 c. 27 d. 22

10. Insert two arithmetic means between $\sqrt{2}$ and 4 $\sqrt{2}$. Which of the following is the first arithmetic mean?
   a. $\sqrt{2}$ b. $2\sqrt{2}$ c. $3\sqrt{2}$ d. $4\sqrt{2}$

11. If a_1 = -4 and a_{25} = -100. Find a_{100}?
   a. -104 b. -150 c. -316 d. -400

12. If a_3 = 8 and a_{16} = 47 and a_k is the kth term of the sequence and a_k = 212, then what is the value of k?
   a. 61 b. 71 c. 81 d. 91

13. Insert 2 arithmetic means between 3 and 30.
   a. 12, 14 b. 12, 11 c. 12, 21 d. 12, 30

14. After one second, a rocket is 30 ft above the ground. After another second, it is 85 feet above the ground. Then after another second, it is already 140 feet above the ground. If it continues to rise at this rate, how many feet above the ground will the rocket be after 16 seconds?
   a. 780 ft b. 830 ft c. 855 ft d. 910 ft

15. An object is dropped from a plane and falls 32 feet during the first second. For each succeeding second, it falls 40 feet more than the distance covered in the preceding second. How far has it fallen after 11 seconds?
   a. 118 feet b. 220 feet c. 315 feet d. 432feet

Lesson 1 Finding the n^{th} Term of an Arithmetic Sequence

What's In

In the previous module, we define what an arithmetic sequence and find the next term of a sequence by adding a constant number.

For example: Find the next three terms of the arithmetic sequence:
3, 8, 13, 18, …

Solution:

a. The terms are $a_1 = 3$, $a_2 = 8$, $a_3 = 13$, and $a_4 = 18$. So, we will be finding a_5, a_6, and a_7.

b. The common difference (d) in the sequence is 5.

c. To get the next three terms, add 5 to each of the preceding term.
Thus: $a_5 = a_4 + 5$
$= 18 + 5$
$= 23$

$a_6 = a_5 + 5$
$= 23 + 5$
$= 28$

$a_7 = a_6 + 5$
$= 28 + 5$
$= 33$

What about if we are required to the 100th term or the 250th term, given the 1st term and the common difference? How can we find the terms? Using the process that is illustrated above will take much of our time and effort. There is a short cut in doing this and that is one of the foci of this module.

What's New

Before we find other higher terms of a sequence, let us first find lower terms. In the arithmetic sequence: 3, 8, 13, 18,...; what is the 15th term?

Solution:

a. By adding the common difference to each of the preceding terms, we get the following values.

n	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
a_n	3	8	13	18	23	28	33	38	43	48	53	58	63	68	73

b. Thus, the 15th term is 73.
However, using this procedure to get any higher nth term would be tedious. Thus, a formula is necessary to find any nth term.

What is It

Let us investigate on how to determine the nth term of a sequence. In the table:

$a_1 = 3$ = 3
$a_2 = 3 + 5$ = 8
$a_3 = 3 + 5 + 5$ = 13
$a_4 = 3 + 5 + 5 + 5$ = 18
. .
. .
. .
$a_{13} = 3 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$ = 63
$a_{14} = 3 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$ = 68
$a_{15} = 3 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 + 5$ = 73

These terms can be written in the following manner as a short cut.

$a_1 = 3$ = 3
$a_2 = 3 + 5\ (1) = 8$
$a_3 = 3 + 5\ (2) = 13$
$a_4 = 3 + 5\ (3) = 18$
. .
. .
. .
$a_{13} = 3 + 5\ (12)$ = 63
$a_{14} = 3 + 5\ (13)$ = 68
$a_{15} = 3 + 5\ (14)$ = 73

Thus, if we find for the 16th term of the arithmetic sequence, then

$a_{16} = 3 + 5\ (15) = 78.$

3 is the first term
5 is the common difference
15 is one less the number of term.

With these, we can derive that pattern that the n^{th} term of the sequence is

$a_n = a_1 + d\ (n-1)$, where:

a_n is the term that corresponds to n^{th} position,
a_1 is the first term, and
d is the common difference.

> The n^{th} term of an arithmetic sequence with first term a_1 and common difference d is given by:
>
> **$a_n = a_1 + d\ (n-1)$**

What's More

Let us apply the formula in solving the following problems:

A. Find the 21^{st} term of the arithmetic sequence: 6, 9, 12, 15,...

Solution:

a. From the sequence, $a_1 = 6$, d = 3, and n = 21.

b. Using the formula, substitute these values.
$a_{21} = 6 + 3\ (21 - 1)$
$a_{21} = 6 + 3\ (20)$
$a_{21} = 6 + 60$
$a_{21} = 66$

c. Thus, the 21^{st} term is 66.

B. In the arithmetic sequence: 7, 10, 13, 16, . . .; find n if $a_n = 304$.

Solution:

a. From the sequence, $a_1 = 7$, d = 3, and $a_n = 304$.

b. Using the formula, substitute these values.
$a_n = a_1 + d\ (n-1)$
$304 = 7 + 3\ (n - 1)$
$304 = 7 + 3n - 3$
$304 = 4 + 3n$
$300 = 3n$
$n = 100$

c. Thus, 304 is the 100^{th} term of the sequence.

C. The 3^{rd} term of an arithmetic sequence is 8 and the 16^{th} term is 47. Find d, a_1 and the 71^{st} term.

Solution:

a. From the sequence, $a_3 = 8$ and $a_{16} = 47$

b. These imply that:
$a_3 = a_1 + d\ (3-1)$ $a_{16} = a_1 + d\ (16-1)$

$8 = a_1 + d(3-1)$ $\qquad$ $47 = a_1 + d(16-1)$

$8 = a_1 + 2d$ Eq. 1 $\qquad$ $47 = a_1 + 15d$ Eq. 2

c. Using Eq. 1 and Eq. 2, solve for a_1 and d. By subtracting Eq. 2 by Eq. 1, then:

$$\begin{aligned} 47 &= a_1 + 15d \\ -(8 &= a_1 + 2d) \\ 39 &= 13d \\ d &= 3 \end{aligned}$$

To solve for a_1, substitute d = 3 to either Eq. 1 or Eq. 2. Using Eq. 1:

$$\begin{aligned} 8 &= a_1 + 2(3) \\ 8 &= a_1 + 6 \\ a_1 &= 2 \end{aligned}$$

Thus, the n^{th} term of the arithmetic sequence is $a_n = 2 + 3(n-1)$

d. Using $a_n = 2 + 3(n-1)$, we can solve for the 71^{st} term.

$a_{71} = 2 + 3(71-1)$
$a_{71} = 2 + 3(70)$
$a_{71} = 2 + 210$
$a_{71} = 212$

Alternative Solution: Another way to solve d is to use the difference formula: $d = \frac{a_n - a_k}{n-k}$

Given : $a_k = a_3 = 8$; $k = 3$ and $a_n = a_{16} = 47$; $n = 16$

Thus, $d = \frac{a_n - a_k}{n-k}$

$= \frac{47-8}{16-3}$

$= \frac{39}{13}$

$= 3$

D. After one second, a rocket is 30 ft above the ground. After another second, it is 85 feet above the ground. Then after another second, it is already 140 feet above the ground. If it continues to rise at this rate, how many feet above the ground will the rocket be after 16 seconds?

Solution:

a. From the problem we let the given be
$a_1 = 30$ $\qquad$ $a_2 = 85$ $\qquad$ $a_3 = 140$

b. Find first d by substituting the given value of a_1 and a_2 in the formula then simplify.
$a_n = a_1 + d(n-1)$
$85 = 30 + d(2-1)$
$55 = d$

c. To find a_{16}, the unknown in the problem substitute the obtained value of d and the given value of $a_1$in the formula then simplify.
$a_{16} = a_1 + d(16-1)$
$= 30 + 55(16-1)$
$= 855$

d. Thus, the rocket will b 855 ft above the ground after 16 seconds.

Activity: Write answer on your answer sheet.

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

_____1. 2, 5, 8, …; 9^{th} term

_____ 2. 3, 5 7, …; 20^{th} term

_____ 3. 1, $\frac{1}{2}$, 0, …; 16^{th} term

_____ 4. 5, 11, 17, …; 9^{th} term

_____ 5. 26, 22, 18, …; 40^{th} term

_____6. 103^{rd} term of the arithmetic sequence if a_1 = -5 and d = -4

_____7. 19^{th} term of the arithmetic sequence if a_1 = 25 and d = -2

_____8. 25^{th} term of the arithmetic sequence if $a_1 = \frac{1}{2}$ and d = $-\frac{3}{8}$.

B. Solve what is asked.

_____ 1. In the sequence 2, 6, 10, …; find n if the n^{th} term is 102.

_____ 2. In the sequence 3, $\frac{7}{3}$, $\frac{5}{3}$, …; find n if the n^{th} term is -27.

_____ 3. Find the15^{th} term of the sequence if a_8 = 5 and a_{21} = -60

_____ 4. Find 5^{th} term of the sequence if a_{15} = 29 and a_{27} = 47

_____ 5. If $a_1 = -4$, $a_{25} = -100$, what is the value of a_{100} ?

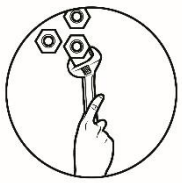
What I Have Learned

Let us see if you understood our lesson by answering the following problems. Write answer on your answer sheet.

1. What is the general formula of finding the n^{th} term of an arithmetic sequence?

2. Given an arithmetic sequence, how do we find the common difference?

3. Given two different n^{th} terms of an arithmetic sequence, how do we find for the common difference?



What I Can Do

A. Give what is asked:
   1. The 10th term of the arithmetic sequence if a_1 = -15 and d = 6.
   2. The 39th term of the arithmetic sequence if a_1 = 40 and d = $\frac{1}{2}$.

B. Find the specified term of each arithmetic sequence.
   1. 1.4, 4.5, 7.6, ...; the 41st term
   2. 9, 18, 27,...; the 23rd term
   3. 14, 6, -2,...; 27th term
   4. 3, 3.25, 3.5,...; 16th term
   5. 1, 4, 7,... ; 28th term

C. Find the specified term.
   1. In the sequence: 0.12, 0.17, 0.22, ...; find n if the nth term is 0.67?
   2. In the sequence: 10, 7, 4, ...; what term has a value of -296?
   3. In the sequence: 2, 6, 10, 14, ...; what **n** corresponds to a_n= 286?
   4. Find 1st term of the sequence if a_5 = 26 and a_{12} = 47.
   5. If a_{24} = 85 , and a_{28} = 100 , what is a_1?

Lesson 2 Computing Arithmetic Means

What's In

In the previous lesson, you learned how to determine the nth term of an arithmetic sequence.

For example: In the sequence: 10, 15, 20, 25,...; what term has a value of 385?

Solution:

a. Using the formula, $a_n = a_1 + d(n - 1)$:

$$385 = 10 + 5 (n - 1)$$
$$385 = 10 + 5n - 5$$
$$385 = 5n + 5$$
$$5n = 385 - 5$$
$$5n = 380$$
$$n = 76$$

b. Thus, 385 is the 76th term of the given sequence.

The next lesson intends to discuss with you how to compute arithmetic means.

What's New

The focus of this part of the module has something to do with finding the arithmetic means.

For example: In the sequence: 4, 8, 12, 16, 20, 24; what is it's arithmetic means.

Solution:

a. The arithmetic mean is a term between the first term and the last term.
b. Thus, 8, 12, 16, and 20 are the arithmetic means of the sequence because these terms are between 4 and 24, which are the first and last term, respectively.

What is It

The first and last terms of a finite arithmetic sequences are called ***arithmetic extremes***, and the terms in between are called ***arithmetic means***. In the sequence 4, 8, 12, 16, 20, 24; the terms 4 and 24 are the arithmetic extremes, while 8, 12, 16, and 20 are the arithmetic means. Also, 8 is the arithmetic mean of the arithmetic extremes, 4 and 12.

The arithmetic mean between two numbers is sometimes called the average of two numbers. If more than one arithmetic means will be inserted between two arithmetic extremes, the formula for d,

$d = \frac{a_n - a_k}{n - k}$, can be used.

The formula for, **d** can be used to find the arithmetic means if more than one arithmetic means will be inserted between two arithmetic extremes.

$$d = \frac{a_n - a_k}{n - k}$$

Let's Try!

A. What is the arithmetic mean between 10 and 24?

Solution

a. Using the average formula, get the arithmetic mean of 10 and 24.
b. Thus, $\frac{10+24}{2} = 17$ is the arithmetic mean.

Activity 1: Using the example above, solve for the arithmetic mean of each of the pairs of arithmetic extremes. Write your answer on your answer sheet.

1. 86, _____, 45
2. 135, _____, 170
3. 50, _____, - 30
4. 125, _____, 60
5. 43, _____, 89

B. Insert three arithmetic means between 8 and 16.

Solution:

a. If three arithmetic means will be inserted between 8 and 16, then $a_1 = 8$ and $a_5 = 16$.

$$\underset{a_1}{8}, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \underset{a_5}{16}$$

b. Using the formula for d, compute for the common difference.

$$d = \frac{a_n - a_k}{n - k}$$
$$= \frac{a_5 - a_1}{5 - 1}$$
$$= \frac{16-8}{5-1}$$
$$= \frac{8}{4}$$
$$= 2$$

c. The arithmetic means are a_2, a_3, and a_4.

$$a_2 = a_1 + d$$
$$= 8 + 2$$
$$= 10$$

$$a_3 = a_2 + d$$
$$= 10 + 2$$
$$= 12$$

$$a_4 = a_3 + d$$
$$= 12 + 2$$
$$= 14$$

d. Thus, the three arithmetic means between the arithmetic extremes, 8 and 16, are 10, 12, and 14.

C. Insert two arithmetic means between $\sqrt{2}$ and $4\sqrt{2}$

Solution:

a. If two arithmetic means will be inserted between $\sqrt{2}$ and $4\sqrt{2}$, then $a_1 = \sqrt{2}$ and $a_4 = 4\sqrt{2}$.

$$\underset{a_1}{\sqrt{2}}, \_\_\_\_\_, \_\_\_\_\_, \underset{a_4}{4\sqrt{2}}$$

b. Using the formula for d, compute for the common difference.

$$d = \frac{a_n - a_k}{n - k}$$

$$= \frac{a_4 - a_1}{4 - 1}$$

$$= \frac{4\sqrt{2} - \sqrt{2}}{4 - 1}$$

$$= \frac{3\sqrt{2}}{3}$$

$$= 2$$

c. The arithmetic means are a_2 and a_3

$$a_2 = a_1 + d$$
$$= \sqrt{2} + \sqrt{2}$$
$$= 2\sqrt{2}$$

$$a_3 = a_2 + d$$
$$= 2\sqrt{2} + \sqrt{2}$$
$$= 3\sqrt{2}$$

d. Thus, the two arithmetic means between $\sqrt{2}$ and $4\sqrt{2}$ are $2\sqrt{2}$ and $3\sqrt{2}$.

D. Find the missing terms of the arithmetic sequence:

_____, 6, _____, _____, 30.

Solution:

a. The arrangement of the terms tells that $a_2 = 6$ and $a_5 = 30$. We are supposed to find for a_1, a_3, and a_4.

b. To find for the unknown, determine the common difference (d).

$$d = \frac{a_n - a_k}{n - k}$$
$$= \frac{a_5 - a_2}{5 - 2}$$
$$= \frac{30 - 6}{5 - 2}$$
$$= \frac{24}{3}$$
$$= 8$$

c. Thus, the value of a_2, a_3, and a_4 are:

$$a_1 = a_2 - d$$
$$= 6 - 8$$
$$= -2$$

$$a_3 = a_2 + d$$
$$= 6 + 8$$
$$= 14$$

$$a_4 = a_3 + d$$
$$= 14 + 8$$
$$= 22$$

Activity 2: Find the missing terms of the following sequence. Write answer on your answer sheet.

1. 15, _____, _____, _____, _____, 45
2. _____, 7, 13, _____, _____
3. _____, 4, _____, 18, _____
4. _____, 9, _____, _____, 36
5. 16, _____, _____, _____, 32

What's More

Let's Do It!

Write answer on your answer sheet.

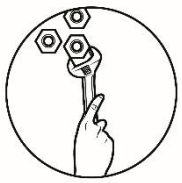
A. What is the arithmetic mean between the two given arithmetic extremes? 1. 5 and 19
   2. $3x^2$ + 8 and x^2 – 6
   3. -2 and 58
   4. 2x + 3y and x – 5y
   5. 13.8 and 15.6

B. Insert the specified number of arithmetic means between the two given arithmetic extremes.
   1. Three arithmetic means between 2 and 22.
   2. Four arithmetic means between 8 and 23.
   3. Two arithmetic means between 41 and 95.
   4. Two arithmetic means between -5 and 1.
   5. Two arithmetic means between 97 and 172.

What I Have Learned

Answer the following questions on your answer sheet.

1. How do we find the arithmetic mean of two arithmetic extremes?
2. When two or more arithmetic means are inserted between two arithmetic extremes, how are they computed?
3. Do infinite sequences have arithmetic means? Why?



What I Can Do

A. What is the arithmetic mean between the given arithmetic extremes?

1. 19 and 7
2. $\frac{3}{11}$ and $\frac{7}{11}$
3. 15x and 23x
4. $9\sqrt{3}$ and $11\sqrt{3}$
5. $6 - 7\sqrt{7}$ and $2 + 3\sqrt{7}$

B. Insert the specified number of arithmetic means between the given arithmetic extremes.

1. Three arithmetic means between 18 and 92.
2. Three arithmetic means between -14 and 6.
3. Four arithmetic means between 24 and -8.
4. Five arithmetic means between 6 and -18.
5. Two arithmetic means between $2\sqrt{5}$ and $14\sqrt{5}$.

Assessment

Choose the letter of your answer from the given options. Write your answer on your answer sheet.

1. Which term of the arithmetic sequence 5, 9, 13, 17, ... is 409?
   a. 99th term b. 100th term c. 111th term d. 102th term

2. Find the nth term of the arithmetic sequence given the following given:
   a_1=5 d= 5 n=25
   a. 25th term is115 c. 25th term is120
   b. 25th term is 125 d. 25th term is130

3. Which term of the arithmetic sequence 5, 9, 13, 17,..... is 401?
   a. 99th term b. 100th term c. 111th term d. 112th term

4. If three arithmetic means are inserted between -15 and 9, find the first of these arithmetic means.
   a. 3 b. -3 c. -6 d. -9

5. Find the 20th term of the arithmetic sequence 5, 9, 13, 17, 21,...
   a. 81 b. 80 c. 82 d. 87

6. If three arithmetic means are inserted between 11 and 39, find the second arithmetic mean.
   a. 18 b. 25 c. 32 d. 46

7. Which term of the arithmetic sequence 4, 1, -2, -5, … is -29?
   a. 9th term b. 10th term c. 11th term d. 12th term

8. What is the arithmetic mean between 15 and 40?
   a. 28.5 b. 29 c. 26 d. 27.5

9. What is the 8th term of the following arithmetic sequence:
   -5, -1, 3, 7, 11,...?
   a. 23 b. 19 c. 27 d. 22

10. Which of the following is the arithmetic mean between $2-\sqrt{3}$ and $4-\sqrt{3}$?
   a. $3-\sqrt{3}$ b. $3-2\sqrt{3}$ c. $3+\sqrt{3}$ b. $3+2\sqrt{3}$

11. If $a_1 = -3$ and $a_5 = 5$. Find a_{10}?
   a. 14 b. 15 c. 16 d. 17

12. If $a_3 = 11$ and $a_5 = 7$ and a_k is the k^{th} term of the sequence and $a_k = -9$, then what is the value of k?
   a. 11 b. 12 c. 13 d. 14

13. Insert 3 arithmetic means between 8 and 16.
   a. 10, 12, 14 b. 9, 10, 11 c. 9, 11, 13 d. 12, 15, 16.

14. After one second, a rocket is 40 ft above the ground. After another second, it is 95 feet above the ground. Then after another second, it is already 150 feet above the ground. If it continues to rise at this rate, how many feet above the ground will the rocket be after 16 seconds?
   a. 780 ft b. 830 ft c. 855 ft d. 865 ft

15. Jose is the track and field representative of the Municipal NHS for the provincial meet. He begins training by running 5 miles during the first week, 6.5 miles during the second week, and 8 miles on the third week. If his training pattern continues, how far will he run on the tenth week?
   a. 18.5 miles b. 20 miles c. 21.5 miles d. 23 miles

Additional Activity

Solve the following word problems correctly on your answer sheet.

1. You have accepted a job with a salary of P27,000 a month during the first year. At the end of each year, you receive a P1500 raise. What is your monthly salary during the first six years?

2. An object is dropped from a plane and falls 32 feet during the first second. For each succeeding second, it falls 40 feet more than the distance covered in the preceding second. How far has it fallen after 11 seconds?

Answer Key

What I Know:

1. B
2. A
3. B
4. C
5. D
6. B
7. D
8. D
9. A
10. B
11. D
12. B
13. C
14. C
15. D

Lesson I: What's More

A.

1. 26
2. 41
3. $-\frac{13}{2}$
4. 53
5. -130
6. -413
7. -11
8. $-\frac{17}{2}$ or -8.5

B. 1. 26

2. 41
3. -30
4. 14
5. -400

Lesson 1:What' I Can Do

A. 1. 39

2. 59

B. 1. 125.4

2. 207
3. -194
4. 6.75
5. 84

C. 1. 12

2. 103
3. 72
4. 14
5. -5/4 or -1.25

Lesson 1:What I Have Learned

1.the general formula is $a_n = a_1 + (n-1)d$
2. and 3. by manipulating the general formula or by substitution to the general formula.

Assessment:

1. D
2. B
3. B
4. D
5. A
6. B
7. D
8. D
9. A
10. A
11. B
12. C
13. A
14. D
15. A

Additional Activity:

1. 34,500.00-
   expected salary
   after six years.
2. After 11 seconds,
   the object is
   dropped 112 feet.

Lesson 2:What' I Can Do

A.1. 13

2. 5/11
3. 19x
4. $10\sqrt{3}$
5. $4\text{-}2\sqrt{7}$

B. 1. 36.5, 55, 73.5

2. -9, -4, 1
3. 17.6, 11.2, 4.8, 1.6
4. 2, -2, -6, -10, -14
5. $6\sqrt{5}$, $10\sqrt{5}$

Lesson 2: What I Have Learned.

Depends on students respond.

What is It

Activity 1

1. 65.5 or 131/2
2. 152.5 or 305/2
3. 10
4. 92.5 or 185/2
5. 66

Activity 2

1. 15, 21, **27, 33, 39**, 45
2. **1**, 7, 13, **19, 25**
3. **-3**, 4, **11**, 18, **25**
4. **0**, 9, **18**, **27**, 36
5. 16, **20, 24, 28**, 32

Lesson 2:What's More:

A. B.

1. 12 1. 7, 12, 17
2. $2x^2 + 1$ 2. 11, 14, 17, 20
3. 28 3. 59, 77
4. $\frac{3}{2}$ x- y 4. -3, -1
5. 14.7 5. 122, 147

References

Callanta, Melvin M., et al.. *Mathematics Learner's Module*.Pasig City, 2015.

Gladys C. Nivera and Minie Rose C. Lapinid. *Grade 10 Mathematics: Patterns and Practicalities.* Makati City, Don Bosco Press, 2015.

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