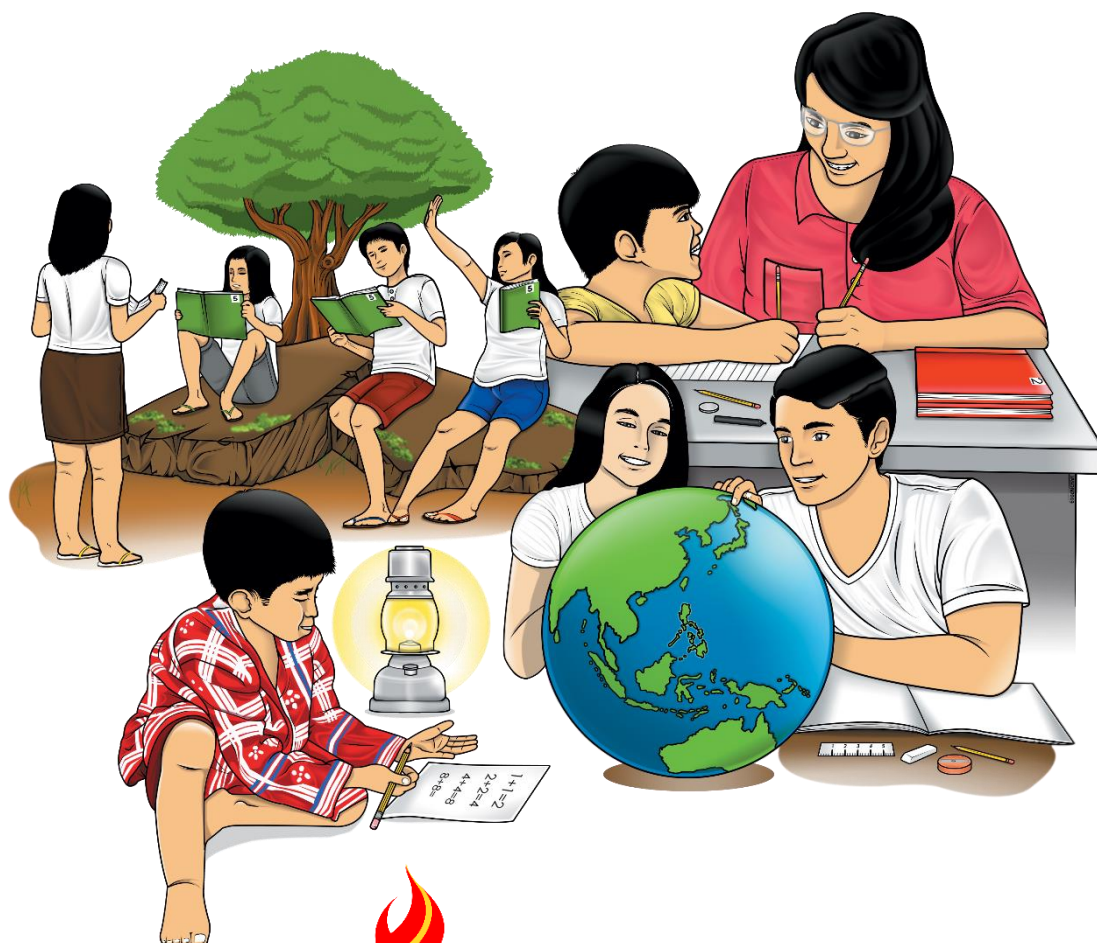


# Mathematics

## Quarter 1 – Module 7: Principal Roots and Irrational Numbers



**Math – Grade 7**  
**Alternative Delivery Mode**  
**Quarter 1 – Module 7: Principal Roots and Irrational Numbers**  
**First Edition, 2020**

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# **Mathematics**

## **Quarter 1 – Module 7:**

### **Principal Roots and Irrational Numbers**

# Introductory Message

For the facilitator:

Welcome to the Mathematics 7 Alternative Delivery Mode (ADM) Module on Principal Roots and Irrational Numbers!

This module was collaboratively designed, developed and reviewed by educators both from public and private institutions to assist you, the teacher or facilitator in helping the learners meet the standards set by the K to 12 Curriculum while overcoming their personal, social, and economic constraints in schooling.

This learning resource hopes to engage the learners into guided and independent learning activities at their own pace and time. Furthermore, this also aims to help learners acquire the needed 21st century skills while taking into consideration their needs and circumstances.

In addition to the material in the main text, you will also see this box in the body of the module:



## ***Notes to the Teacher***

This contains helpful tips or strategies that will help you in guiding the learners.

As a facilitator you are expected to orient the learners on how to use this module. You also need to keep track of the learners' progress while allowing them to manage their own learning. Furthermore, you are expected to encourage and assist the learners as they do the tasks included in the module.

For the learner:

Welcome to the Mathematics 7 Alternative Delivery Mode (ADM) Module on Principal roots and Irrational Numbers!

The hand is one of the most symbolized part of the human body. It is often used to depict skill, action and purpose. Through our hands we may learn, create and accomplish. Hence, the hand in this learning resource signifies that you as a learner is capable and empowered to successfully achieve the relevant competencies and skills at your own pace and time. Your academic success lies in your own hands!

This module was designed to provide you with fun and meaningful opportunities for guided and independent learning at your own pace and time. You will be enabled to process the contents of the learning resource while being an active learner.

This module has the following parts and corresponding icons:



***What I Need to Know***

This will give you an idea of the skills or competencies you are expected to learn in the module.



***What I Know***

This part includes an activity that aims to check what you already know about the lesson to take. If you get all the answers correct (100%), you may decide to skip this module.



***What's In***

This is a brief drill or review to help you link the current lesson with the previous one.



***What's New***

In this portion, the new lesson will be introduced to you in various ways such as a story, a song, a poem, a problem opener, an activity or a situation.



***What is It***

This section provides a brief discussion of the lesson. This aims to help you discover and understand new concepts and skills.



***What's More***

This comprises activities for independent practice to solidify your understanding and skills of the topic. You may check the answers to the exercises using the Answer Key at the end of the module.



***What I Have Learned***

This includes questions or blank sentence/paragraph to be filled in to process what you learned from the lesson.



***What I Can Do***

This section provides an activity which will help you transfer your new knowledge or skill into real life situations or concerns.



### **Assessment**

This is a task which aims to evaluate your level of mastery in achieving the learning competency.



### **Additional Activities**

In this portion, another activity will be given to you to enrich your knowledge or skill of the lesson learned. This also tends retention of learned concepts.



### **Answer Key**

This contains answers to all activities in the module.

At the end of this module you will also find:

### **References**

This is a list of all sources used in developing this module.

The following are some reminders in using this module:

1. Use the module with care. Do not put unnecessary mark/s on any part of the module. Use a separate sheet of paper in answering the exercises.
2. Don't forget to answer *What I Know* before moving on to the other activities included in the module.
3. Read the instruction carefully before doing each task.
4. Observe honesty and integrity in doing the tasks and checking your answers.
5. Finish the task at hand before proceeding to the next.
6. Return this module to your teacher/facilitator once you are through with it.

If you encounter any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator. Always bear in mind that you are not alone.

We hope that through this material, you will experience meaningful learning and gain deep understanding of the relevant competencies. You can do it!



## ***What I Need to Know***

This module was designed and written with you in mind. It is here to help you master the Principal Roots and Irrational Numbers. The scope of this module permits it to 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 the order in which you read them can be changed to correspond with the textbook you are now using.

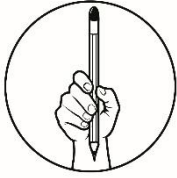
The module is divided into two lessons, namely:

- Lesson 1 – Principal Roots and its Nature (Rational or Irrational)
- Lesson 2 – Determine between what two integers the square root of a number lie.

After going through this module, you are expected to:

1. define Principal Root;
2. describe principal roots and tells whether they are rational or irrational;
3. determine between what two integers the square root of a number lie.

***Learning Competency Code: M7NS-Ig-***



## ***What I Know***

Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.

1. What do you call a number that **can** be expressed in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers, and  $b$  is not equal to 0?
  - a. Integers
  - b. Irrational
  - c. natural
  - d. rational
2. Which of the following refers to a number whose decimal representation is neither terminating nor repeating? This number cannot be expressed as a quotient of integers.
  - a. Integers
  - b. Irrational
  - c. natural
  - d. rational
3. What do you call the positive  $n^{\text{th}}$  root of a number?
  - a. perfect square
  - b. principal root
  - c. radical
  - d. radicand
4. What is the principal root of  $\sqrt{25}$ ?
  - a. 2
  - b. 5
  - c. 25
  - d. 50
5. What is the principal root of  $\sqrt{10}$ ?
  - a. 3.162277660...
  - b. 5
  - c. 10
  - d. 100
6. Which of the following describes the principal root of  $\sqrt{50}$ ?
  - a. Integers
  - b. Irrational
  - c. natural
  - d. rational
7. Which of the numbers is classified as perfect square integer?
  - a. 6
  - b. 9
  - c. 12
  - d. 20
8. Between what two consecutive integers does the square root of 18 lie?
  - a. 3 & 4
  - b. 4 & 5
  - c. 5 & 6
  - d. 16 & 25
9. Find the number whose square root lies between 5 and 6.
  - a. 24
  - b. 25
  - c. 26
  - d. 36
10. Find the square root of 16.
  - a. 4
  - b. 5
  - c. 6
  - d. 8
11. Which of the following has an irrational principal root?
  - a. 4
  - c. 16



- b. 9
- d. 20
12. Which of the following square roots lies between 2 and 3.
- a.  $\sqrt{2}$
- c.  $\sqrt{5}$
- b.  $\sqrt{3}$
- d.  $\sqrt{10}$
13. Which of the following is not a perfect square integer?
- a. 25
- c. 63
- b. 49
- d. 81
14. Between what two consecutive integers does the square root of 33 lie?
- a. 4 & 5
- c. 6 & 7
- b. 5 & 6
- d. 7 & 8
15. Find the principal root of  $\sqrt{121}$ .
- A. 10
- c. 12
- B. 11
- d. 13

**Lesson****1****Principal Roots and its Nature (Rational or Irrational)*****What's In***

You have performed operations on the set of rational numbers. Now let's check your prior knowledge.

A. Find the product of the following:

| Given           | Product |
|-----------------|---------|
| 1.) $1 \cdot 1$ |         |
| 2.) $2 \cdot 2$ |         |
| 3.) $3 \cdot 3$ |         |
| 4.) $4 \cdot 4$ |         |
| 5.) $5 \cdot 5$ |         |

| Given              | Product |
|--------------------|---------|
| 6.) $6 \cdot 6$    |         |
| 7.) $7 \cdot 7$    |         |
| 8.) $8 \cdot 8$    |         |
| 9.) $9 \cdot 9$    |         |
| 10.) $10 \cdot 10$ |         |

B. Tell whether the given number is a Rational or Irrational

\_\_\_\_\_ 1.) 25

\_\_\_\_\_ 4.) 1.414235...

\_\_\_\_\_ 2.)  $\frac{1}{2}$

\_\_\_\_\_ 5.) 3.666...

\_\_\_\_\_ 3.)  $\sqrt{3}$

\_\_\_\_\_ 6.) 8.660254...

***Notes to the Teacher***

The student may use the scientific calculator in their android phone to easily check the principal root of a number.



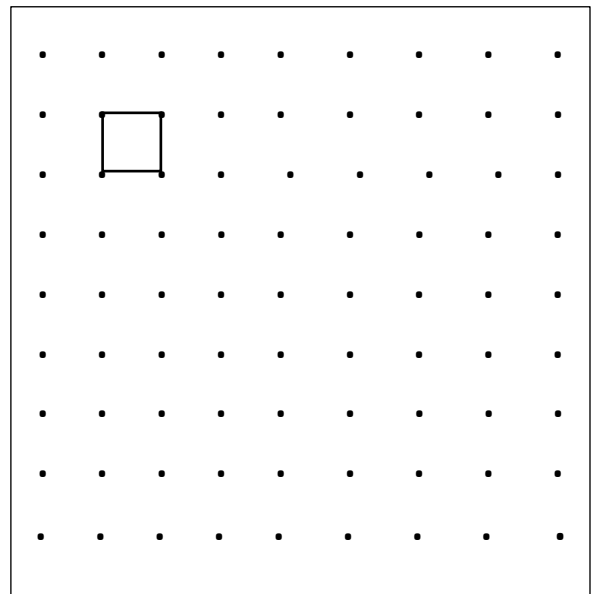
## What's New

This module contains the concept of Principal Roots and how to determine whether it is rational or irrational.

### Let's explore!

You have learned to use the length of a side of a square to find the area. You can use this area to find the length of a side.

The square shown on the right has a side 1 unit long. Its area is 1 square unit.



1. Make a square with area of 4 square units on the grid. What is the length of the side?
2. Make a square with area of 9 square units on the grid. What is the length of the side?
3. Make a square of an area of 2 square units.
  - a. How do you know that the area of the square you have done is 2 square units?
  - b. How do you know that the figure you drew is a square?
  - c. Estimate the length of a side of the square.

### Try this!

Using a scientific calculator (*or your android phone*), input the following and get the equivalent value.

1.  $\sqrt{36} = \underline{\hspace{2cm}}$

3.  $\sqrt{2} = \underline{\hspace{2cm}}$

5.  $\sqrt{81} = \underline{\hspace{2cm}}$

2.  $\sqrt{64} = \underline{\hspace{2cm}}$

4.  $\sqrt{50} = \underline{\hspace{2cm}}$

6.  $\sqrt{75} = \underline{\hspace{2cm}}$



## What is It

A real number has its Principal Root that can be extracted when using the symbol  $\sqrt{\quad}$  that is known as *radical sign*. The combination of the radical sign together with the number is called a *radical*. The number under the radical sign is known as the *radicand*.

**Here it is!**

| Radical     | Radicand | Principal Root |
|-------------|----------|----------------|
| $\sqrt{36}$ | 36       | 6              |
| $\sqrt{2}$  | 2        | 1.414235       |

**Let's define more!**

### Definition

**Principal Root** is a number which produces a specific quantity when multiplied by itself. It is the positive  $n^{\text{th}}$  root of a number.

A **Perfect Square** is the square of a rational number.

**Rational Number** is a number that can be expressed in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers, and  $b$  is not equal to 0.

**Irrational Number** is a number whose decimal representation is neither terminating nor repeating. This number cannot be expressed as a quotient of integers.

**Let's Analyze it!**

Earlier you have tried to get the equivalent value of each of the following using a scientific calculator. You have also known that the equivalent value is called Principal Root.

1.  $\sqrt{36} = \underline{6}$

3.  $\sqrt{2} = \underline{1.414235...}$

5.  $\sqrt{81} = \underline{9}$

2.  $\sqrt{64} = \underline{8}$

4.  $\sqrt{50} = \underline{7.071067...}$

6.  $\sqrt{75} = \underline{8.660254...}$

Notice that some Principal Roots are whole numbers while some are decimal numbers. That means:

- when a Principal Root is a **whole number or fraction**, then the **Principal Root is described as Rational**.
- when a Principal Root is a **non-terminating or non-repeating decimal number**, then the **Principal Root is described as Irrational**.

### Let's conceptualize it!

To determine whether a Principal Root is Rational or Irrational, we need to get first the Principal Root of a number. We can use a scientific calculator to get the exact Principal Root of a certain number and tell if it's Rational or Irrational. We can also use the concept of Perfect Squares to separate Rational from Irrational Principal Root.

Consider the given below:

| Given           | Product |
|-----------------|---------|
| 1.) $1 \cdot 1$ | 1       |
| 2.) $2 \cdot 2$ | 4       |
| 3.) $3 \cdot 3$ | 9       |
| 4.) $4 \cdot 4$ | 16      |
| 5.) $5 \cdot 5$ | 25      |

| Given              | Product |
|--------------------|---------|
| 6.) $6 \cdot 6$    | 36      |
| 7.) $7 \cdot 7$    | 49      |
| 8.) $8 \cdot 8$    | 64      |
| 9.) $9 \cdot 9$    | 81      |
| 10.) $10 \cdot 10$ | 100     |

All the derived products are considered **Perfect Squares**. Perfect Squares are numbers that have Rational numbers as Principal Roots.

Moreover, taking the Principal Root of a number is like doing the reverse operation of squaring a number.

Thus,

1.) when  $1 \cdot 1 = 1$ , then,  $\sqrt{1} = 1$

*Now, since we have extracted a Rational number which is 1, therefore, we can say that the **Principal Root of  $\sqrt{1}$  is Rational.***

2.) when  $2 \cdot 2 = 4$ , then,  $\sqrt{4} = 2$

*Now, since we have extracted a Rational number which is 2, therefore, we can say that the **Principal Root of  $\sqrt{4}$  is Rational.***

3.) when  $3 \cdot 3 = 9$ , then,  $\sqrt{9} = 3$

*Now, since we have extracted a Rational number which is 3, therefore, we can say that the **Principal Root of  $\sqrt{9}$  is Rational.***

4.) also when  $\frac{4}{5} \cdot \frac{4}{5} = \frac{16}{25}$ , then,  $\sqrt{\frac{16}{25}} = \frac{4}{5}$

Now, since we have extracted a Rational number which is  $\frac{4}{5}$ ,  
therefore, we can say that the **Principal Root of  $\sqrt{\frac{16}{25}}$  is Rational.**

Hence, the **Principal Root of all Perfect Squares** such as but not limited to,  
 $\sqrt{1}, \sqrt{4}, \sqrt{9}, \sqrt{16}, \sqrt{25}, \sqrt{36}, \sqrt{49}, \sqrt{64}, \sqrt{81}, \sqrt{100}, \dots, \sqrt{n^2}$  are **Rational.**

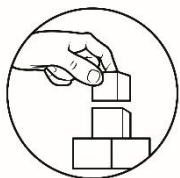
On the other hand, when a number is **not a Perfect Square**, then its **Principal Root is Irrational.**

Example:

1.)  $\sqrt{2}$  Can you think of any number that when multiplied by itself will give an answer of 2? **None.** We can say then that 2 is not a Perfect Square, therefore, **the Principal Root of  $\sqrt{2}$  is Irrational.**

2.)  $\sqrt{15}$  Can you think of any number that when multiplied by itself will give an answer of 15? **None.** We can say then that 15 is not a Perfect Square, therefore, **the Principal Root of  $\sqrt{15}$  is Irrational.**

3.)  $\sqrt{\frac{3}{10}}$  Can you think of any number that when multiplied by itself will give an answer of  $\frac{3}{10}$ ? **None.** We can say then that  $\frac{3}{10}$  is not a Perfect Square, therefore, **the Principal Root of  $\sqrt{\frac{3}{10}}$  is Irrational.**



## ***What's More***

Determine whether the Principal Root of a number is Rational or Irrational.

\_\_\_\_\_ 1.  $\sqrt{49}$

\_\_\_\_\_ 2.  $\sqrt{3}$

\_\_\_\_\_ 3.  $\sqrt{50}$

\_\_\_\_\_ 4.  $\sqrt{26}$

\_\_\_\_\_ 5.  $\sqrt{81}$

\_\_\_\_\_ 6.  $\sqrt{121}$

\_\_\_\_\_ 7.  $\sqrt{\frac{25}{64}}$

\_\_\_\_\_ 8.  $\sqrt{12}$

\_\_\_\_\_ 9.  $\sqrt{144}$

\_\_\_\_\_ 10.  $\sqrt{\frac{6}{21}}$

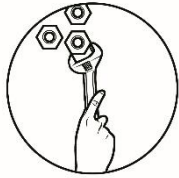


## ***What I Have Learned***

Based on your understanding of the lesson, complete the following sentences.

1. A real number has a \_\_\_\_\_ that can be described as Rational or Irrational.
2. The square of a Rational Number is considered \_\_\_\_\_.
3. When a number is Perfect Square, then its Principal Root is \_\_\_\_\_.
4. When the Principal Root of a number is non-terminating or non-repeating decimal, then that Principal Root is described as \_\_\_\_\_.
5. When extracting the Principal Root of a real number, it can be described as either \_\_\_\_\_ or \_\_\_\_\_.





## ***What I Can Do***

Since you have already learned Principal Roots and Perfect Squares, then you are now ready to apply your learning into a real-life situation.

Consider the illustration below as a Land Area.

A. Draw Perfect Square lot as many as you can.



B. List down the Area and the length of each of the square lot you have drawn. You may use separate paper for more answers.

| Area (sq. units) | Length (unit) |
|------------------|---------------|
|                  |               |
|                  |               |
|                  |               |
|                  |               |
|                  |               |

**Lesson****2****Determine between what two consecutive integers the square root of a number lie.*****What's In***

In your previous lesson, you have learned how to describe the principal root if it is rational or irrational. Now, let us review about perfect square integers.

**NOTE:** The Perfect Squares (also called "Square of a Number") are the squares of the integers.

A. Continue to answer from 2-15, number 1 was already done for you.

| Exponential Form | Expanded Form | Perfect Square Integers |
|------------------|---------------|-------------------------|
| $1^2$            | $1 \cdot 1$   | 1                       |
| $2^2$            | $2 \cdot 2$   |                         |
| $3^2$            | $3 \cdot 3$   |                         |
| $4^2$            | $4 \cdot 4$   |                         |
| $5^2$            | $5 \cdot 5$   |                         |
| $6^2$            | $6 \cdot 6$   |                         |
| $7^2$            | $7 \cdot 7$   |                         |
| $8^2$            | $8 \cdot 8$   |                         |
| $9^2$            | $9 \cdot 9$   |                         |
| $10^2$           | $10 \cdot 10$ |                         |
| $11^2$           | $11 \cdot 11$ |                         |
| $12^2$           | $12 \cdot 12$ |                         |
| $13^2$           | $13 \cdot 13$ |                         |
| $14^2$           | $14 \cdot 14$ |                         |
| $15^2$           | $15 \cdot 15$ |                         |

Try to remember them up to 15!

B. Give what is asked.

1. Can you take the exact value of  $\sqrt{12}$ ? \_\_\_\_\_
2. Is  $\sqrt{12}$  an irrational number? \_\_\_\_\_
3. List 2 perfect square integers nearest to 12. \_\_\_\_\_
4. Find the square root of the two perfect squares in item no. 3. \_\_\_\_\_
5. Between what two positive integers does  $\sqrt{12}$  lie? \_\_\_\_\_



***Notes to the Teacher***

*Students should know how to get the principal root of a given number and memorize the list of perfect square integers.*



## ***What's New***

Between every two whole numbers are countless decimal numbers.

Consider the decimal number 2.123456789. This is not a kind of number we use in our daily life because it's neither 2 nor 3 but it's a number between 2 and 3.

Now try to determine between what two whole numbers each of the following decimal lie.

1. \_\_\_\_\_, 4.00677, \_\_\_\_\_
2. \_\_\_\_\_, 1.9933, \_\_\_\_\_
3. \_\_\_\_\_, 0.00144, \_\_\_\_\_
4. \_\_\_\_\_, 10.5008, \_\_\_\_\_
5. \_\_\_\_\_, 100.2001, \_\_\_\_\_



## What is It

If a principal root is an irrational number, the easiest way you can do is to determine between what two integers the square root of a number lie.

Now, let us start with our discussion on how to determine the two consecutive integers where the square root of a number lie.

The principal roots of the radicals below are between two integers. Find the two closest integers.

a.  $\sqrt{12}$

b.  $\sqrt{18}$

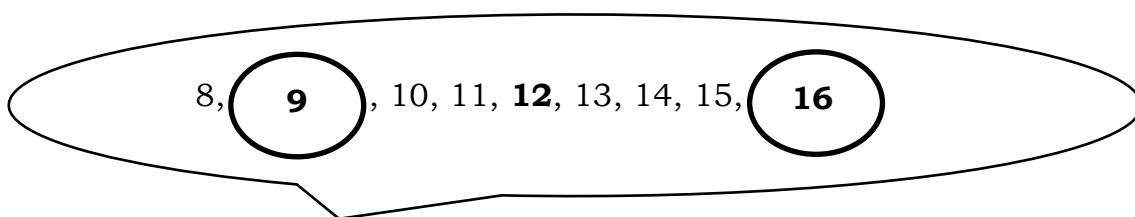
c.  $\sqrt{40}$

d.  $\sqrt{175}$

**Solution:**

a.  $\sqrt{12}$

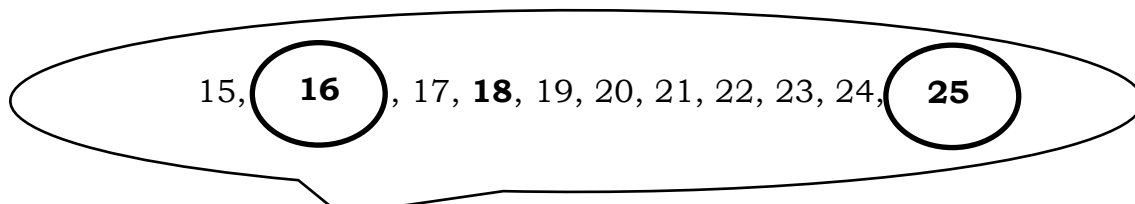
Think of two consecutive perfect square integers where 12 is in between of them.



So we have **9** and **16**. Take the square roots of these numbers. Since the principal root of  $\sqrt{9}$  is **3** while the principal root of  $\sqrt{16}$  is **4**. Thus,  $\sqrt{12}$  is between **3** and **4**.

b.  $\sqrt{18}$

Think of two consecutive perfect square integers where 18 is in between of them.



So we have **16** and **25**. Take the square roots of these numbers. Since the principal root of  $\sqrt{16}$  is **4** while the principal root of  $\sqrt{25}$  is **5**. Thus,  $\sqrt{18}$  is between **4** and **5**.

c.  $\sqrt{40}$

Think of two consecutive perfect square integers where 40 is in between of them.

35, **36**, 37, 38, 39, **40**, 41, 42, 43, 44, 45, 46, 47, 48, **49**



So we have **36** and **49**. Take the square roots of these numbers. Since the principal root of  $\sqrt{36}$  is **6** while the principal root of  $\sqrt{49}$  is **7**. Thus,  $\sqrt{40}$  is between **6** and **7**.

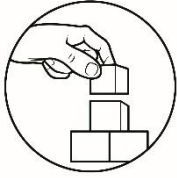
d.  $\sqrt{175}$

Think of two consecutive perfect square integers where 175 is in between of them.

168, **169**, 170, 171, 172, 173, 174, **175**, 176, ... **196**



So we have **169** and **196**. Take the square roots of these numbers. Since the principal root of  $\sqrt{169}$  is **13** while the principal root of  $\sqrt{196}$  is **14**. Thus,  $\sqrt{175}$  is between **13** and **14**.



## What's More

A. Determine between what two consecutive integers each principal root lie. Write your answer on the space provided.

1.  $\sqrt{77}$

\_\_\_\_\_

2.  $\sqrt{87}$

\_\_\_\_\_

3.  $\sqrt{50}$

\_\_\_\_\_

4.  $\sqrt{136}$

\_\_\_\_\_

5.  $\sqrt{243}$

\_\_\_\_\_

6.  $\sqrt{6}$

\_\_\_\_\_

7.  $\sqrt{160}$

\_\_\_\_\_

8.  $\sqrt{94}$

\_\_\_\_\_

9.  $\sqrt{118}$

\_\_\_\_\_

10.  $\sqrt{159}$

\_\_\_\_\_

B. Which country consumes the most chocolate per head?

To answer that question, determine between what particular range of integers the square root of each number lie and write the letter in the box that corresponds to your answer.

**A**  
 $\sqrt{24}$

**R**  
 $\sqrt{38}$

**T**  
 $\sqrt{90}$

**S**  
 $\sqrt{15}$

**W**  
 $\sqrt{136}$

**E**  
 $\sqrt{72}$

**L**  
 $\sqrt{7}$

**O**  
 $\sqrt{146}$

**N**  
 $\sqrt{112}$

**D**  
 $\sqrt{2}$

**I**  
 $\sqrt{30}$

**Y**  
 $\sqrt{49}$

**Z**  
 $\sqrt{60}$

|       |         |       |        |       |       |       |       |       |         |       |
|-------|---------|-------|--------|-------|-------|-------|-------|-------|---------|-------|
|       |         |       |        |       |       |       |       |       |         |       |
| 3 & 4 | 11 & 12 | 5 & 6 | 9 & 10 | 7 & 8 | 8 & 9 | 6 & 7 | 2 & 3 | 4 & 5 | 10 & 11 | 1 & 2 |



## ***What I Have Learned***

Would you like to find out how much you have learned from this module?

A. Refer to the statements below and tell whether the given statement is TRUE or FALSE. Write your answer on the space provided.

- \_\_\_\_\_ 1. Estimating is one way to determine where the irrational square root of a number lie.
- \_\_\_\_\_ 2. The square root of 25 is a perfect square.
- \_\_\_\_\_ 3. The square root of 30 lies between 3 and 4.
- \_\_\_\_\_ 4. The square root of 121 lies between 10 and 11.
- \_\_\_\_\_ 5. Only perfect square integers have a square root.

B. Write your insights about the topic:

1. How will you know if the square root of a given number is rational or irrational?

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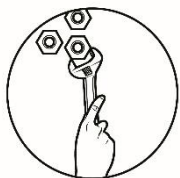
2. Have you encountered any difficulty in determining between what two integers the square root of a given number lies? Why?

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## ***What I Can Do***

Here is another activity that let you apply what you have learned about our lesson.

Complete the following statements. Use the integers that are closest to the value of the number in the middle. Write your chosen integers inside the box.

1.   $< \sqrt{19} <$

2.   $< \sqrt{34} <$

3.   $< \sqrt{76} <$

4.   $< \sqrt{115} <$

5.   $< \sqrt{217} <$

6.   $< \sqrt{86} <$

7.   $< \sqrt{10} <$

8.   $< \sqrt{43} <$

9.   $< \sqrt{6} <$

10.   $< \sqrt{54} <$

You did a great job in applying what you have learned in this topic.



## Assessment

Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper.

1. What do you call a number that **can** be expressed in the form  $\frac{a}{b}$ , where  $a$  and  $b$  are integers, and  $b$  is not equal to 0?
  - a. Integers
  - b. Irrational
  - c. natural
  - d. rational
2. Which of the following refers to a number whose decimal representation is neither terminating nor repeating? This number cannot be expressed as a quotient of integers.
  - a. Integers
  - b. Irrational
  - c. natural
  - d. rational
3. What do you call the positive  $n^{\text{th}}$  root of a number?
  - a. perfect square
  - b. principal root
  - c. radical
  - d. radicand
4. What is the principal root of  $\sqrt{81}$ ?
  - a. -9
  - b. 8
  - c. 9
  - d. 81
5. What is the principal root of  $\sqrt{\frac{9}{4}}$ ?
  - a.  $\frac{3}{2}$
  - b.  $\frac{3}{4}$
  - c.  $\frac{9}{2}$
  - d.  $\frac{9}{4}$
6. Which of the following best describes the principal root of  $\sqrt{50}$ ?
  - a. integer
  - b. irrational
  - c. natural
  - d. rational
7. Which of the following best describes the principal root of  $\sqrt{121}$ ?
  - a. integer
  - b. irrational
  - c. natural
  - d. rational
8. Which of the statements is TRUE?
  - a.  $\sqrt{7}$  is an integer
  - b.  $\sqrt{16}$  is an irrational number
  - c.  $\sqrt{25}$  is a rational number
  - d.  $\sqrt{90}$  is neither rational nor irrational number
9. Find the number whose square root lies between 8 and 9?
  - a. 8
  - b. 9
  - c. 75
  - d. 85

10. Between what two consecutive integers does the square root of 118 lie?
- a. 8 & 9
  - b. 9 & 10
  - c. 10 & 11
  - d. 11 & 12
11. Which of the numbers is classified as perfect square integer?
- a. 49
  - b. 50
  - c. 63
  - d. 200
12. Between what two consecutive integers does the square root of 190 lie?
- a. 11 & 12
  - b. 13 & 14
  - c. 14 & 15
  - d. 19 & 20
13. Which of the following numbers has an irrational square root?
- a. 1
  - b. 81
  - c. 100
  - d. 300
14. Which of the following is NOT a perfect square integer?
- a. 121
  - b. 144
  - c. 149
  - d. 169
15. Where does the square root of 30 lie?
- a. between 5 & 6
  - b. beyond 6
  - c. before 5
  - d. at 6



## ***Additional Activities***

Additional activity will be given to enrich your knowledge about the lesson that you have learned in this module.

**Direction:**

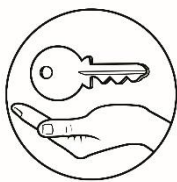
Match the radicals in Column A to the nearest two integers where its square root lies in Column B. Write your answer on the space provided before the number.

Column A

- |           |              |
|-----------|--------------|
| _____ 1.  | $\sqrt{8}$   |
| _____ 2.  | $\sqrt{14}$  |
| _____ 3.  | $\sqrt{67}$  |
| _____ 4.  | $\sqrt{102}$ |
| _____ 5.  | $\sqrt{20}$  |
| _____ 6.  | $\sqrt{3}$   |
| _____ 7.  | $\sqrt{198}$ |
| _____ 8.  | $\sqrt{112}$ |
| _____ 9.  | $\sqrt{146}$ |
| _____ 10. | $\sqrt{122}$ |

Column B

- |    |         |
|----|---------|
| A. | 8 & 9   |
| B. | 14 & 15 |
| C. | 12 & 13 |
| D. | 2 & 3   |
| E. | 1 & 2   |
| F. | 4 & 5   |
| G. | 11 & 12 |
| H. | 3 & 4   |
| I. | 6 & 7   |
| J. | 10 & 11 |
| K. | 7 & 8   |
| L. | 9 & 10  |



## Answer Key

|  |   |  |
|--|---|--|
| <p><b>Lesson 1:</b><br/><b>What's More</b></p> <p>1. Rational<br/>2. Irrational<br/>3. Irrational<br/>4. Irrational<br/>5. Rational<br/>6. Rational<br/>7. Rational<br/>8. Irrational<br/>9. Rational<br/>10. Irrational</p> | <p><b>Lesson 1:</b><br/><b>What's In</b></p> <p>A.<br/>1. 1<br/>2. 4<br/>3. 9<br/>4. 16<br/>5. 25<br/>6. 36<br/>7. 49<br/>8. 64<br/>9. 81<br/>10. 100</p> <p>B.<br/>1. Rational<br/>2. Rational<br/>3. Irrational<br/>4. Irrational<br/>5. Rational<br/>6. Irrational</p> | <p><b>Lesson 1:</b><br/><b>What I Know</b></p> <p>1. D<br/>2. B<br/>3. B<br/>4. B<br/>5. A<br/>6. B<br/>7. B<br/>8. B<br/>9. C<br/>10. A<br/>11. D<br/>12. C<br/>13. C<br/>14. B<br/>15. B</p> |
| <p><b>Lesson 2:</b><br/><b>What's New</b></p> <p>A.<br/>1. 4 &amp; 5<br/>2. 1 &amp; 2<br/>3. 0 &amp; 1<br/>4. 10 &amp; 11<br/>5. 100 &amp; 101</p>   | <p><b>Lesson 2:</b><br/><b>What's In</b></p> <p>A.<br/>4, 9, 16, 25, 36, 49, 64,<br/>81, 100, 121, 144, 169,<br/>196, 225</p> <p>B.<br/>1. NO<br/>2. YES<br/>3. 9, 16<br/>4. 3 and 4<br/>5. 3 and 4</p>   | <p><b>Lesson 1:</b><br/><b>What's I have Learned</b></p> <p>1. Principal Root<br/>2. Perfect Square<br/>3. Rational<br/>4. Irrational<br/>5. Rational, Irrational</p>                          |

|  |  |   |
|--|--|---|
| <p><b>Assessment</b></p> <p>1. D<br/>2. B<br/>3. B<br/>4. C<br/>5. A<br/>6. B<br/>7. D<br/>8. C<br/>9. C<br/>10. C<br/>11. A<br/>12. B<br/>13. D<br/>14. C<br/>15. A</p> | <p><b>Lesson 2:</b><br/><b>What's I have</b><br/><b>Learned</b></p> <p>1. TRUE<br/>2. FALSE<br/>3. FALSE<br/>4. FALSE<br/>5. FALSE</p> <p><b>Lesson 2:</b><br/><b>What I can Do</b></p> <p>1. 4 &amp; 5<br/>2. 5 &amp; 6<br/>3. 8 &amp; 9<br/>4. 10 &amp; 11<br/>5. 14 &amp; 15<br/>6. 9 &amp; 10<br/>7. 3 &amp; 4<br/>8. 6 &amp; 7<br/>9. 2 &amp; 3<br/>10. 7 &amp; 8</p> | <p><b>Lesson 2:</b><br/><b>What's More</b></p> <p>A.<br/>1. 8 &amp; 9<br/>2. 9 &amp; 10<br/>3. 7 &amp; 8<br/>4. 11 &amp; 12<br/>5. 15 &amp; 16<br/>6. 2 &amp; 3<br/>7. 12 &amp; 13<br/>8. 9 &amp; 10<br/>9. 10 &amp; 11<br/>10. 12 &amp; 13</p> <p>B.<br/>SWITZERLAND</p> |
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## ***References***

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