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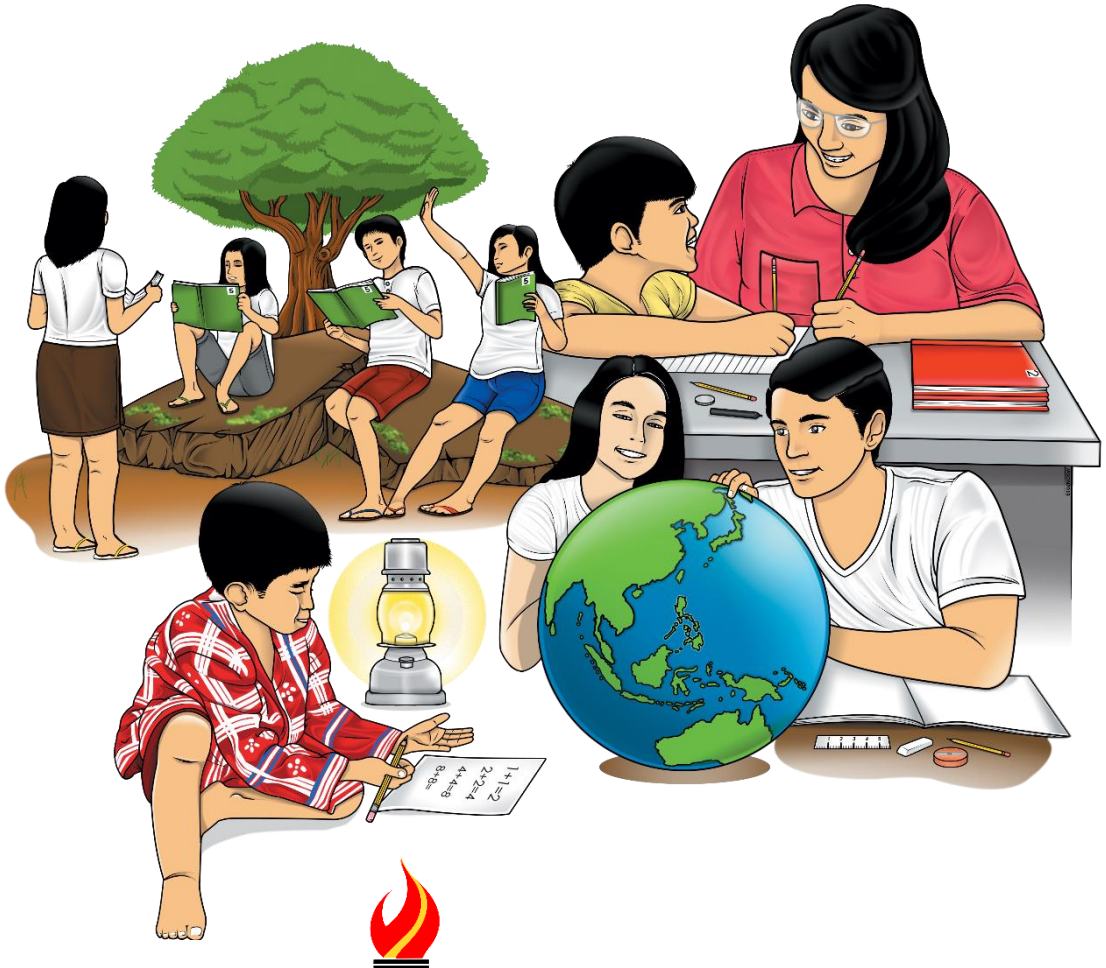
Mathematics

Quarter 1 – Module 8: Estimating the Square Roots of Whole Numbers and Plotting Irrational Numbers



ALTERNATIVE DELIVERY MODE
ADM

Mathematics – Grade 7
Alternative Delivery Mode
Quarter 1 – Module 8: Estimating Square Roots of Whole Numbers and Plotting Irrational Numbers
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Quarter 1 – Module 8: Estimating the Square Roots of Whole Numbers and Plotting Irrational Numbers

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Introductory Message

For the facilitator:

Welcome to the Mathematics 7 Alternative Delivery Mode (ADM) Module on Estimating the Square Roots of Whole Numbers and Plotting 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:

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.

Notes to the Teacher

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

For the learner:

Welcome to the Mathematics 7 Alternative Delivery Mode (ADM) Module on Estimating the Square Roots of Whole Numbers and Plotting Irrational Numbers!

The hand is one of the most symbolized parts 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. Do not 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

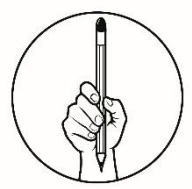
This module was designed and written with you in mind. It is here to help you master the nature of Principal Roots and Irrational Numbers. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons 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.

This module is divided into two lessons, namely:

- Lesson 1 – Estimate the square root of a whole number to the nearest hundredth; and
- Lesson 2 – Plotting irrational numbers on a number line.

OBJECTIVES:

1. Estimate the square root of a whole number to the nearest hundredth; and
2. Plot irrational numbers (square roots) on a number line.



What I Know

PRE-ASSESSMENT

Find out how much you already know about this module. Read each statement carefully. Choose the letter of the best answer. Write the chosen letter on a separate sheet of paper. After taking and checking this short test, take note of the items that you were not able to answer correctly. Then, discover the correct answer as you go through this module.

1. Which whole number is closest to $\sqrt{46}$?
   A. 5 B. 6 C.7 D. 8

2. Identify which perfect square is closest to $\sqrt{181}$?
   A. 4 B. 9 C. 16 D. 25

3. Which of the following is the perfect square number closest but less than 20?
   A. 16 B. 19 C. 22 D. 25

4. Which of the following is the perfect square number closest but greater than 136?
   A. 100 B. 138 C. 144 D. 169

5. Between which consecutive numbers is the estimate $\sqrt{10}$ lie?
   A. 2 and 3 B. 3 and 4 C. 4 and 5 D. 5 and 6

6. Which of the following is the closest approximation of$\sqrt{51}$?
   A. 6.64 B. 6.94 C. 7.04 D. 7.14

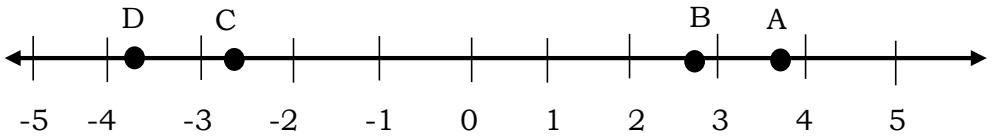
7. What is the square root of 15 to the nearest hundredths?
   A. 3.01 B. 3.27 C. 3.52 D. 3.87

8. Which of the following number is the estimate of$\sqrt{125}$?
   A. 10.18 B. 11.18 C. 12.18 D. 13.18

9. Estimate$\sqrt{78}$.
   A. 7.38 B. 7.83 C. 8.38 D. 8.83

10. What is the square root of 60 to the nearest hundredths?
    A. 7.75 B. 7.76 C. 7.77 D. 7.78

For numbers 11 – 12. Refer the given number line below



11. Which letter most accurately represents the location of $-\sqrt{14}$ on the number line?

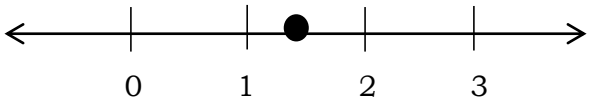
A. A B. B C. C D. D

12. Which letter most accurately represents the location of $\sqrt{8}$ on the number line?

A. A B. B C. C D. D

13. Locate and plot $\sqrt{2}$ on a number line.

A.



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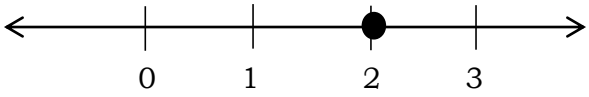

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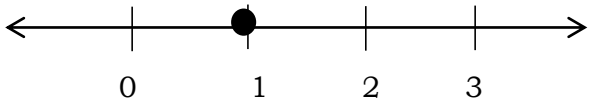

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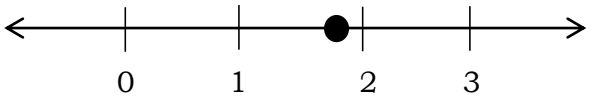
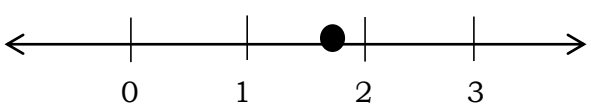


14. Locate and plot $\sqrt{5}$ on a number line.

A.



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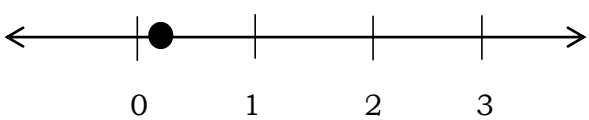

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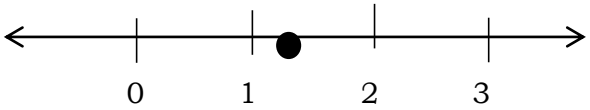

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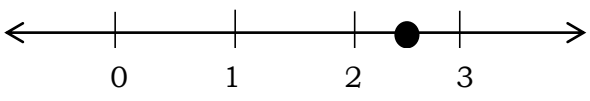
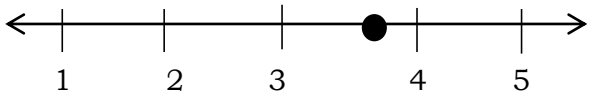


15. Locate and plot $\sqrt{23}$ on a number line.

A.



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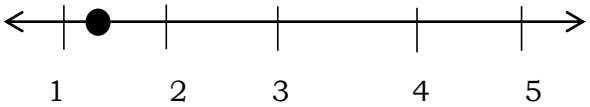

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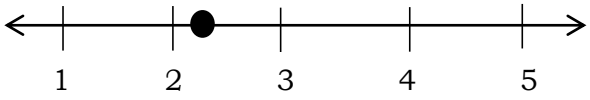


D.

How was your performance in the pre-assessment? Were you able to answer all the questions? Are all problems familiar to you?

Lesson 1 Estimates the Square Root of Whole Number to the Nearest Hundredths

You have learned Principal roots and Irrational numbers in the previous module and you already know how to evaluate square roots that are perfect squares. But what if the whole number given is not a perfect square? How can you find the square root of this number? What are the different ways/methods that you can use to look for the answer?
These are some of the questions which you can answer once you understand the key concepts of estimating square roots of a whole number to the nearest hundredths.

What's In

Let's Recall!

Find the square/cube root of each number.

1. $\sqrt{25}$
2. $\sqrt{64}$
3. $\sqrt{169}$
4. $\sqrt{100}$
5. $\sqrt{289}$
6. $\sqrt{400}$
7. $\sqrt[3]{8}$
8. $\sqrt[3]{27}$
9. $\sqrt{196}$
10. $\sqrt[3]{1000}$

From the activity done, were you able to name two consecutive integers between the given square roots? But how about if you are tasked to find the estimate value of the given square roots that are not perfect squares? What are you going to do? You will find this out in activities in the next section. Before performing these activities, read and understand first how they are used in real-life situation.

Notes to the Teacher

Let the student explore his ideas guide him that he can express his skills and talents. Facilitate him to enhance his output

What's New

Arlo is enjoying his time with the Baseball team in his school. The players and the coaches have all been very friendly to him and Arlo loves helping out. He usually assist the players in the preparation prior to the game. He also handles them out towels and water. Sometimes, he collects and organizes equipment after the game.

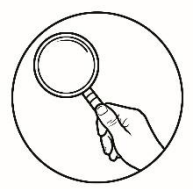
The team is also active in their social responsibility to the community by doing a lot of community service. They conduct small league tournaments that encourages the youth to love and play baseball. The team also grants scholarships to those who wish to join. Arlo has been invited to go along with the team in these events.

There is one new ball field being created and the team was tasked to help design the infield so that it has the correct dimensions.

When Arlo and one of the players, JJ, arrived in the field, they measured the distance from home plate to first base. It measures 67 feet.

"That isn't correct," JJ tells Arlo. "The area of the infield for league should be 4900 square feet. This measurement is inaccurate. We have to help them fix it." What is inaccurate about the 67 feet? Arlo is puzzled. Does it have to be a longer distance or a shorter one?

To figure this problem out, Arlo will need to use his knowledge of squares and square roots. This lesson will expand upon what you learned in the previous lesson. Then you can help Arlo figure this problem out at the end of the lesson.



What is It

Estimate the square roots of a whole numbers to the nearest hundredths

When you are finding the square root of a perfect square number using a calculator, you probably notice that the answer is a whole number, on the other hand each time you find the square root of numbers that are not a perfect square, you will see several digits after the decimal point.

This means that the square root of that number is a whole number and some fraction of another.

To determine the approximate value of the square root of a number that is not a perfect square, a series of estimation is made.

Let's look at an example.

Estimate each square root to the nearest hundredths.

A. $\sqrt{7}$ B. $-\sqrt{44}$ C. $\sqrt{125}$ D. $\sqrt{263}$ E. $\sqrt{73}$

Solution:

A. $\sqrt{7}$

Step 1: Find the perfect squares closest (less than and greater than) to the given number.

Since 7 is not a perfect square, we need to find the two perfect squares that is closest to 7. They are: 4 and 9 because $\sqrt{4} < \sqrt{7} < \sqrt{9}$ or $2 < \sqrt{7} < 3$.

Therefore $\sqrt{7}$ lies between 2 and 3. And since 7 is closer to 9 than 4, we know that $\sqrt{7}$ is closer to 3 than 2.

Step 2: Make an educated guess to 1 decimal place and try it.

Since we know that square root of 7 is closer to 3 than 2, we then square numbers closer to 3 with one decimal place

$(2.5)^2 = 6.25$
$(2.6)^2 = 6.76$ ← The $\sqrt{7}$ lies between 2.6
$(2.7)^2 = 7.29$ ← and 2.7.
$(2.8)^2 = 7.84$

Note: Squaring of 2.1, 2.2, 2.3, and 2.4 is not necessary since square root of 7 is closest to 3.

Step 3: Decide which is closer.

Since 7 is closer to 6.76 compared to 7.29 and 6.76 is the square of 2.6 then estimate further by squaring the numbers 2.61, 2.62, 2.63, 2.63, 2.64, and 2.65.

$(2.61)^2 = 6.8121$
$(2.62)^2 = 6.8644$
$(2.63)^2 = 6.9169$
$(2.64)^2 = 6.9696$
$(2.65)^2 = 7.0225$

Note: Squaring 2.66, 2.67, 2.68, and 2.69 is not necessary since $\sqrt{7}$ is closer to 2.6 than 2.7.

Notice that 7 is closer to 7.0225 compared to 6.9696. Meanwhile, 7.0225 is the square of 2.65.

Hence, $\sqrt{7}$ **is 2.65 when estimated to nearest hundredths.**

B. $\sqrt{44}$

Step 1: Find the perfect squares closest (less than and greater than) to the given number.

Since 44 is not a perfect square, we need to find the two perfect squares that is closest to 44. They are: 36 and 49 because $\sqrt{36} < \sqrt{44} < \sqrt{49}$ or $6 < \sqrt{44} < 7$.

Therefore $\sqrt{44}$ lies between 6 and 7. And since 44 is closer to 49 than 36, we know that $\sqrt{49}$ is closer to 7 than 6.

Step 2: Make an educated guess to 1 decimal place and try it.

Since we know that the square root of 44 is closer to 7 than 6, we then square numbers closer to 7 with one decimal place.

$(6.5)^2 = 42.25$
$(6.6)^2 = 43.56$
$(6.7)^2 = 44.89$
$(6.8)^2 = 46.24$
$(6.9)^2 = 47.61$

The $\sqrt{44}$ lies between 6.6 and 6.7.

Note: Squaring 6.61, 6.62, 6.63, and 6.64 is not necessary since $\sqrt{44}$ is closest to 7.

Step 3: Decide which is closer.

Since 44 is closer to 43.56 compared to 44.89 and 43.56 is the square of 6.6 then estimate further by squaring the numbers 6.61, 6.62, 6.63, 6.63, and 6.64.

$(6.61)^2 = 43.6921$ $(6.63)^2 = 44.0896$

$(6.62)^2 = 43.8244$ $(6.64)^2 = 44.2225$

Note: Squaring 6.65, 6.66, 6.67, 6.68 and 6.69 is not necessary since $\sqrt{44}$ is closer to 6.6 than 6.7.

Notice that 44 is closer to 44.0896 compared to 43.8244. Meanwhile, 44.0896 is the square of 6.63.

Hence, **$\sqrt{44}$ is 6.63 when estimated to nearest hundredths.**

C. $\sqrt{125}$

Step 1: Find the perfect squares closest (less than and greater than) to the given number.

Since 125 is not a perfect square, we need to find the two perfect squares that is closest to 125. They are: 121 and 144 because $\sqrt{121} < \sqrt{125} < \sqrt{144}$ or $11 < 1\sqrt{144} <12$.

Therefore $\sqrt{125}$ lies between 11 and 12. And since 125 is closer to 121 than 144, we know that $\sqrt{125}$ is closer to 11 than 12.

Step 2: Make an educated guess to 1 decimal place and try it.

Since we know that the square root of 125 is closer to11 than 12, we then square numbers closer to 11 with one decimal place

$(11.1)^2 = 123.21$  The $\sqrt{125}$ lies between

$(11.2)^2 = 125.44$ 11.1 and 11.2.

$(11.3)^2 = 127.69$

Note: Squaring of 11.4, 11.5, 11.6, 11.7, 11.8, and 11.9 is not necessary since square root of 125 is closest to 11.

Step 3: Decide which is closer.

Since 125 is closer to 125.44 compared to 123.21 and 125.44 is the square of 11.2 then estimate further by squaring the numbers 11.16, 11.17, 11.18, and 11.19.

$(11.15)^2 = 124.3225$ $(11.18)^2 = 124.9924$

$(11.16)^2 = 124.5456$ $(11.19)^2 = 125.2161$

$(11.17)^2 = 124.7689$

Note: Squaring 11.11, 11.12, 11.13, and 11.14 is not necessary since $\sqrt{125}$ is closer to 11.2 than 11.1.

Notice that 125 is closer to 124.9924 compared to 125.2161. Meanwhile, 124.9924 is the square of 11.18.

Hence, **$\sqrt{125}$ is 11.18 when estimated to nearest hundredths.**

D. $\sqrt{263}$

Step 1: Find the perfect squares closest (less than and greater than) to the given number.

Since 263 is not a perfect square, we need to find the two perfect squares that is closest to 263. They are: 256 and 289 because $\sqrt{256} < \sqrt{263} < \sqrt{289}$ or $16 < 1\sqrt{263} <17$.

Therefore $\sqrt{263}$ lies between 16 and 17. And since 263 is closer to 256 than 289, we know that $\sqrt{263}$ is closer to 16 than 17.

Step 2: Make an educated guess to 1 decimal place and try it.

Since we know that the square root of 263 is closer to16 than 17, we then square numbers closer to 16 with one decimal place

$(16.1)^2 = 259.21$
$(16.2)^2 = 262.44$
$(16.3)^2 = 265.69$

The $\sqrt{263}$ lies between 16.2 and 16.3.

Note: Squaring of 16.4, 16.5, 16.6, 16.7, 16.8, and 16.9 is not necessary since square root of 263 is closest to 16.

Step 3: Decide which is closer.

Since 263 is closer to 261.44 compared to 265.69 and 261.44 is the square of 16.2 then estimate further by squaring the numbers 16.21, 16.22, and 16.23.

$(16.21)^2 = 262.7641$
$(16.22)^2 = 263.0884$
$(16.23)^2 = 263.4129$

Note: Squaring 16.24, 16.25, 16.26, 16.27, 16.28, and 16.29 is not necessary since $\sqrt{263}$ is closer to 16.2 than 16.3.

Notice that 263is closer to 263.0884 compared to 263.4129. Meanwhile, 263.0884 is the square of 16.22.

Hence, **$\sqrt{263}$ is 16.22 when estimated to nearest hundredths.**

E. $\sqrt{73}$

Step 1: Find the perfect squares closest (less than and greater than) to the given number.

Since 73 is not a perfect square, we need to find the two perfect squares that is closest to 73. They are: 64 and 81 because $\sqrt{64} < \sqrt{73} < \sqrt{81}$ or $8 < \sqrt{73} < 9$.

Therefore $\sqrt{73}$ lies between 8 and 9. And since 73 is closer to 81 than 64, we know that $\sqrt{73}$ is closer to 9 than 8.

Step 2: Make an educated guess to 1 decimal place and try it.

Since we know that the square root of 73 is closer to 9 than 8, we then square numbers closer to 8 with one decimal place.

$(8.5)^2 = 72.25$
$(8.6)^2 = 73.96$
$(8.7)^2 = 75.69$

The $\sqrt{73}$ lies between 8.5 and 8.6.

Note: Squaring of 8.1, 8.2, 8.3 and 8.4 is not necessary since square root of 263 is closest to 16.

Step 3: Decide which is closer.

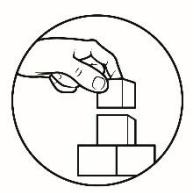
Since 73 is closer to 72.25 compared to 73.96 and 72.25 is the square of 8.5 then estimate further by squaring the numbers 8.51, 8.51, 8.53, 8.54, and 8.55

$(8.51)^2 = 72.4201$
$(8.52)^2 = 72.5904$
$(8.53)^2 = 72.7609$
$(8.54)^2 = 72.9316$
$(8.55)^2 = 73.1025$

Note: Squaring 8.56, 8.57, 8.58, and 8.59 is not necessary since $\sqrt{73}$ is closer to 8.5 than 8.6.

Notice that 73 is closer to 72.9316 compared to 73.1025. Meanwhile, 72.9316 is the square of 8.54.

Hence, $\sqrt{73}$ **is 8.54 when estimated to nearest hundredths.**



What's More

Estimate Me!

A. Estimate each square root to the nearest hundredths.

1. $\sqrt{50}$
2. $\sqrt{89}$
3. $\sqrt{21}$
4. $\sqrt{143}$
5. $\sqrt{250}$
6. $\sqrt{136}$
7. $\sqrt{101}$
8. $\sqrt{3}$
9. $\sqrt{67}$
10. $\sqrt{208}$

B. Decipher the code below to find the answer to the given trivia. Estimate the square root of a whole number to the nearest hundredths.

"What animal has the largest heart?"

8.19	14.07	6.56	6.16

11.09	14.18	9.95	14.07	6.16

A $\sqrt{99}$
E $\sqrt{38}$
W $\sqrt{123}$
G $\sqrt{87}$
L $\sqrt{198}$
H $\sqrt{201}$

B $\sqrt{67}$
U $\sqrt{43}$
R $\sqrt{92}$
O $\sqrt{58}$
F $\sqrt{39}$
S $\sqrt{44}$

From the activity done, were you able to estimate the estimated square root of the given whole number in the nearest hundredths?

What I Have Learned

Answer the following questions. Give your solutions or explanations.

1. How do you find the square roots of a whole number which are not perfect squares?

   _____
   _____
   _____

2. What are steps to follow in order for you to find the estimation of the given square roots which are not perfect squares?

   _____
   _____
   _____

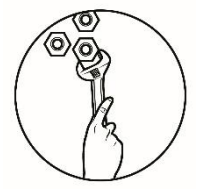
3. How do you find the square root of 2?

   _____
   _____
   _____

4. Did you find any difficulty in estimating the square roots of a whole number?

   _____
   _____
   _____

Were you able to answer all the questions in the activity? Do you have better understanding now on how to estimate the square roots of a whole numbers that are not perfect squares in the nearest hundredths? In the next activity, let's extend your understanding by applying the concepts in real-life situation.



What I Can Do

Here is another activity that will let you apply what you learned about estimating the square root of a whole number in the nearest hundredths.

Read and solve the following problems:

1. Ericka owns a square lot with a land area 237 square feet. To the nearest hundredths of a foot, what is the side length of the kitchen floor?

2. Aevryn wants to use this tile to finish the floor in her room. The room is a square room and the area of the floor is 441 square feet. She wants to put 8" tiles along the edge of the floor.

    a. What is the length of one side of the room?

    b. How many tiles can she fit along one side?

3. You use one gallon of white paint to apply a base coat of paint on a square wall mural. The paint covers 380 square feet per gallon. Estimate the side length of the mural to the nearest hundredths of a foot.

Lesson 2 Plotting Irrational Numbers on a Number Line

You have learned in the previous lesson on how to estimate square roots of a whole number which are not perfect squares. But what about if you are tasked to plot these square roots on a number line? How are you going to do this?

These are some of the questions which you can answer once you understand the key concepts of estimating square roots of a whole number to the nearest hundredths and how to plot these square roots on a number line.

What's In

Let's Recall!

Name the two consecutive integers between which the given square roots lie.

1. $\sqrt{2}$
2. $\sqrt{7}$
3. $\sqrt{28}$
4. $\sqrt{150}$
5. $\sqrt{41}$
6. $\sqrt{175}$
7. $\sqrt{84}$
8. $\sqrt{12}$
9. $\sqrt{213}$
10. $\sqrt{423}$

From the activity done, were you able to name two consecutive integers between the given square roots? But how about if you are tasked to locate the square roots of the given number on a line? What are you going to do? You will find this out in activities in the next section. Before performing these activities, read and understand first how they are used in real-life situation.

Notes to the Teacher

Let the student explore his ideas guide him that he can express his skills and talents. Facilitate him to enhance his output

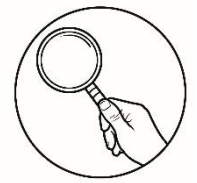
What's New

How to Plot?

Jose and Daniel planned to do their performance task given by their teacher in Math subject on Saturday. They agreed that Jose will go to the house of Daniel as their meeting place. Daniel said that, his house is $\sqrt{11}$km away from the house of Jose.

1. How far is Daniel's house from Jose's house?
2. Can you visualize or picture out how far is the distance between their houses?
3. How can you plot $\sqrt{11}$ on a number line?

Can you answer the first question? If yes, how will you answer it? Is it possible for you to use a number line to determine how far their houses from one another? Your goal in the next section is to learn on how to use a number line to help you identify where the square roots are located.

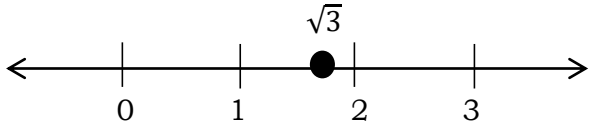


What is It

In plotting irrational numbers on a number line, we estimate first the square root of the given irrational number and to which two consecutive integers it lies in between.

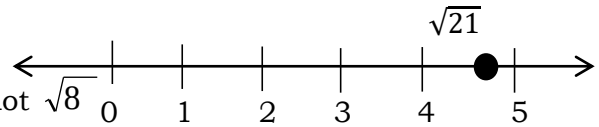
A. Locate and plot $\sqrt{3}$ on a number line.

This number is between 1 and 2, principal roots of 1 and 4. Since 3 is closer to 4 than to 1, $\sqrt{3}$ is closer to 2. Plot $\sqrt{3}$ closer to 2.



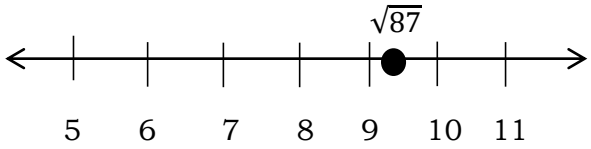
B. Locate and plot $\sqrt{21}$ on a number line.

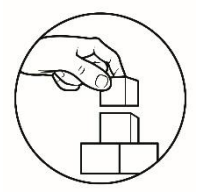
This number is between 4 and 5, principal roots of 16 and 25. Since 21 is closer to 25 than to 16, $\sqrt{21}$ is closer to 5 than to 4. Plot $\sqrt{21}$ closer to 5.



C. Locate and plot $\sqrt{8}$

This number is between 9 and 10, principal roots of 81 and 100. Since 87 is closer to 81, $\sqrt{87}$ then is closer to 9 than to 10. Plot $\sqrt{87}$ closer to 9.

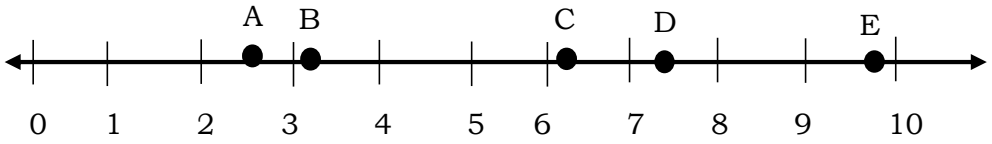




What's More

Where I Am?

In this activity, estimate the given square root and find the letter that corresponds to it at the number line.

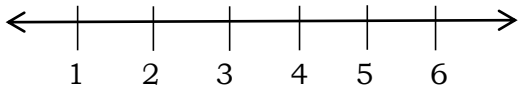


1. $\sqrt{57}$ 2. $\sqrt{6}$ 3. $\sqrt{99}$ 4. $\sqrt{38}$ 5. $\sqrt{11}$

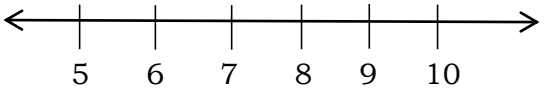
Locate Me!

Plot the points on a number line.

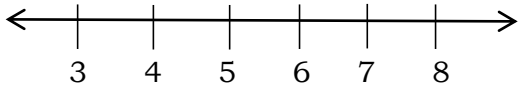
1. Point A: $\sqrt{18}$



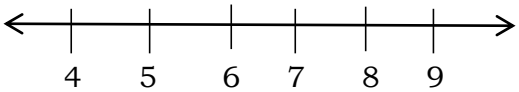
2. Point B: $\sqrt{73}$



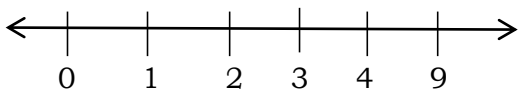
3. Point C: $\sqrt{30}$



4. Point D: $\sqrt{52}$



5. Point E: $\sqrt{7}$



What I Have Learned

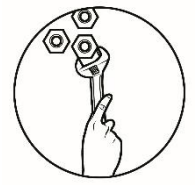
Answer the following questions.

1. How do you plot $\sqrt{2}$ on a number line?

_____
_____
_____

2. What are your ways/steps in plotting irrational numbers on a number line?

_____
_____
_____



What I Can Do

Here is another activity that will let you apply what you learned about plotting square roots on a number line. Round off your answer to the nearest hundredths.

1. Ms. Liza is buying a square piece of land which is 548 square meters in area. What is the length of each side of the land?

2. If a square bedroom has an area of 111square feet, what is the length of one wall?

3. Mr. Cruz owns a square garden with area of 245 square feet. How much fencing will a gardener need to buy in order to place fencing around the garden of Mr. Cruz if each foot cost 55 pesos?

4. Anna wants to put up a frame for her window. She knows that the area of her window is 82 square feet. What is the estimate perimeter of the window?

5. Aerox bought a square carpet with an area of 95 square feet for his dining room. What is the approximate length of one side of the carpet?

Assessment

Multiple Choice. Choose the letter of the correct answer. Write the chosen letter on a separate sheet of paper.

1. Which whole number is closest to $\sqrt{154}$?

   A. 10 B. 11 C.12 D. 13

2. Identify which perfect squares is closest to 216?

   A. 196 B. 225 C. 256 D. 289

3. Which of the following is the perfect square number closest but less than 137?

   A. 100 B. 121 C. 125 D. 144

4. Which of the following is the perfect square number closest but greater than 239?

   A. 196 B. 225 C. 256 D. 289

5. Between which consecutive numbers is the estimate $\sqrt{57}$ lie?

   A. 4 and 5 B. 6 and 7 C. 7and 8 D. 8 and 9

6. Which of the following is the closest approximation of$\sqrt{109}$?

   A. 9. 44 B. 9.45 C. 10.44 D. 10.45

7. What is the square root of 63 to the nearest hundredths?

   A. 7.94 B. 7.95 C. 8.05 D. 8.23

8. Which of the following number is the estimate of$\sqrt{146}$?

   A. 11.08 B. 11.18 C. 12.08 D. 12.18

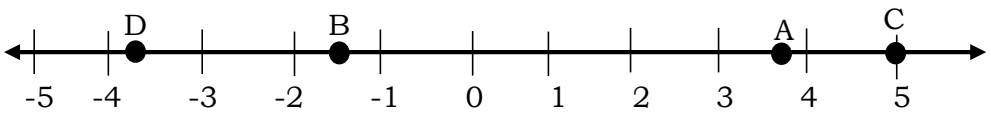
9. Estimate$\sqrt{103}$.

   A. 10. 05 B. 10.15 C. 10.21 D. 10.23

10. What is the square root of 176 to the nearest hundredths?

    A. 13.19 B. 13.27 C. 13.38 D. 13.64

For numbers 11 – 12. Refer your answer on the given number line below.



11. Which letter most accurately represents the location of $-\sqrt{19}$ on a number line?

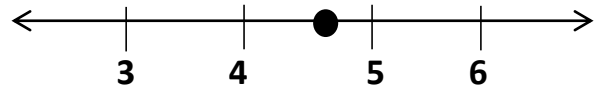
A. A B. B C. C D. D

12. Which letter most accurately represents the location of $\sqrt{26}$ on a number line?

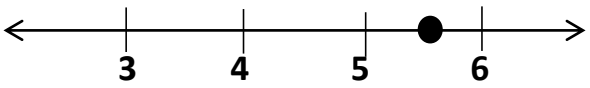
A. A B. B C. C D. D

13. Locate and plot $\sqrt{32}$ on a number line.

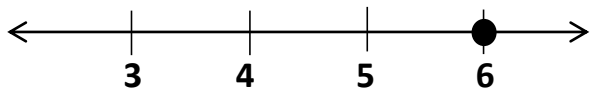
A.



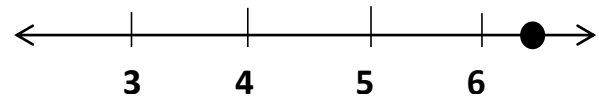
B.



C.

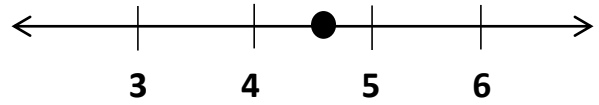


D.

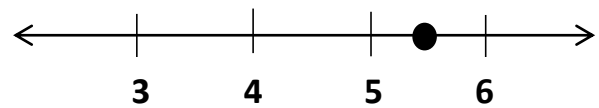


14. Locate and plot $\sqrt{21}$ on a number line.

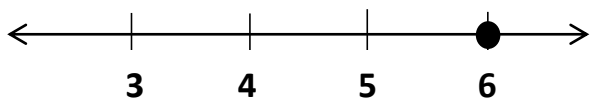
A.



B.



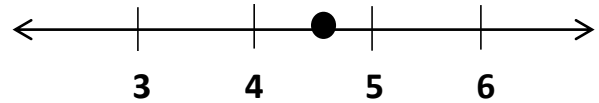
C.



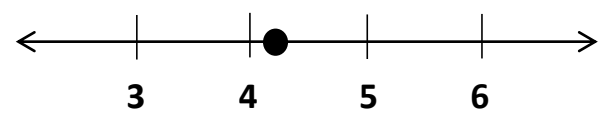
D.

15. Locate and plot $\sqrt{15}$ on a number line.

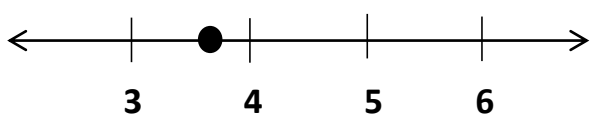
A.



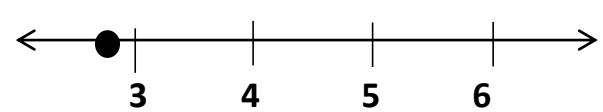
B.



C.



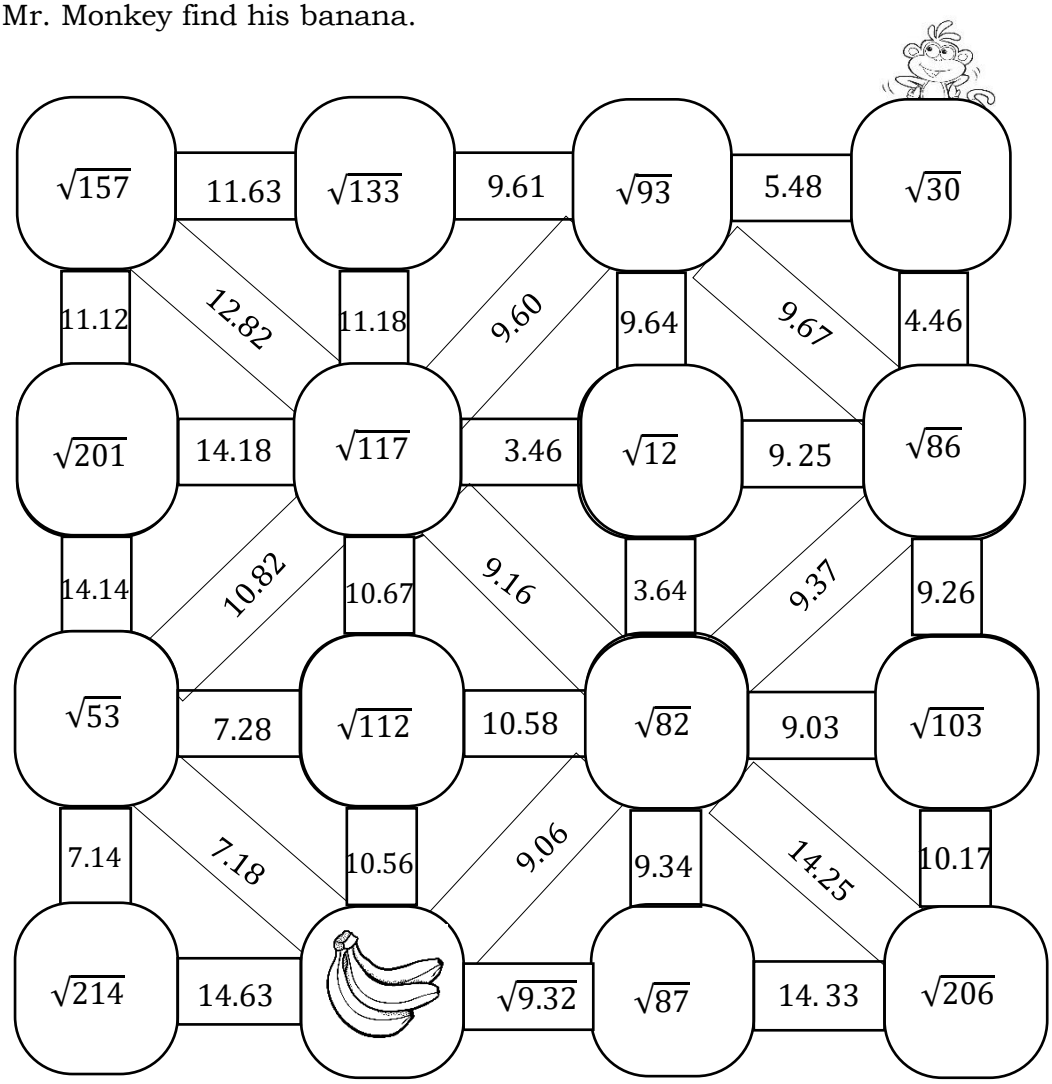
D



Additional Activities

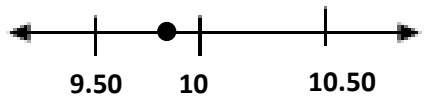
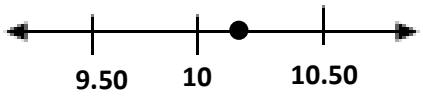
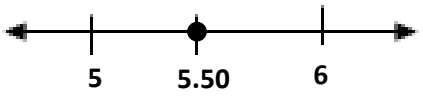
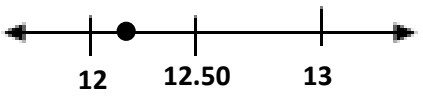
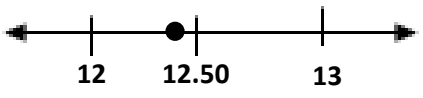
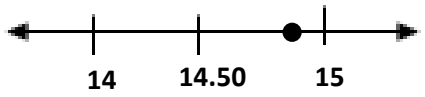
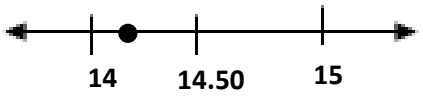
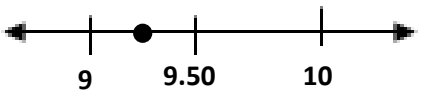
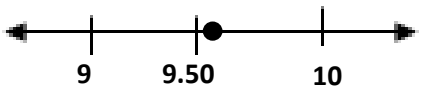
Make Your Way!

Help Mr. Monkey find his way for his breakfast. By estimating the square root in the nearest hundredths and following the correct answer to end the maze, you can help Mr. Monkey find his banana.



What's wrong with me?

Identify which of the following illustrates the correct graph of a square roots. Cross-out the box of the wrong answer.

$\sqrt{105}$		
$\sqrt{33}$		
$\sqrt{148}$		
$\sqrt{217}$		
$\sqrt{86}$		

Answer Key

Lesson 1

What I Know

Pre-Assessment

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

What's In

Let's Recall

1. 5
2. 8
3. 13
4. 10
5. 17
6. 20
7. 2
8. 3
9. 14
10. 10

What's New

The distance between each of the bases should be 70 feet. With a current distance of 67 feet, the distance is short three feet between each base.

What I Can Do

1. 15.39 feet
2. a. 21 feet
   b. 29 feet
3. 19.49 feet

What's More

A. Estimate Me!

1. 7.07
2. 9.43
3. 4.58
4. 11.96
5. 15.81
6. 11.66
7. 10.05
8. 1.73
9. 8.19
10. 14.42

B. Trivia
BLUE WHALE

Lesson 2

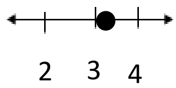
What's In

Let's Recall

1. 1 and 2
2. 2 and 3
3. 5 and 6
4. 12 and 13
5. 6 and 7
6. 13 and 14
7. 9 and 10
8. 3 and 4
9. 14 and 15
10. 20 and 21

What's New

1. 3.32 km
2. 2
3.



What's More

Where I am

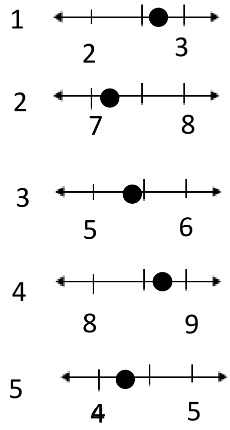
1. D
2. A
3. E
4. C
5. B

What I Can Do

1. 23.41m
2. 10.54ft
3. P 860.75
4. 36.24 ft
5. 9.75ft

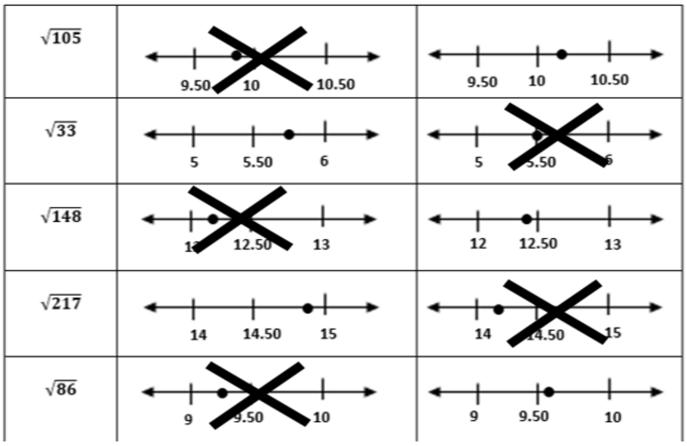
What's More

Locate Me



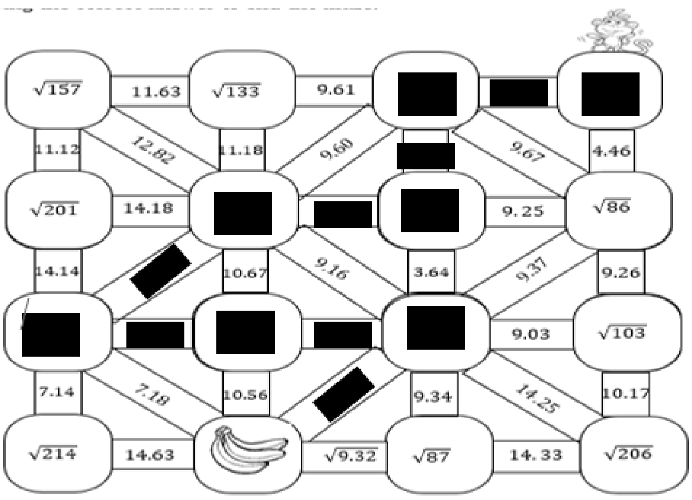
Additional Activities

What's wrong with me!



Additional Activities

Make a Way



Assessment

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

References

1.Barker, T. 2016. Estimating Irrational Numbers. (online) Available at: https://slideplayer.com/slide/9373261/. (Accessed 1 June 2020).

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3. Nivera, G. C. (2003). *Explorations and Application*: Elementary Algebra (87 – 88). Makati City:Salesiana Publisher,Inc.

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Department of Education – SOCCSKSARGEN
Learning Resource Management System (LRMS)

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