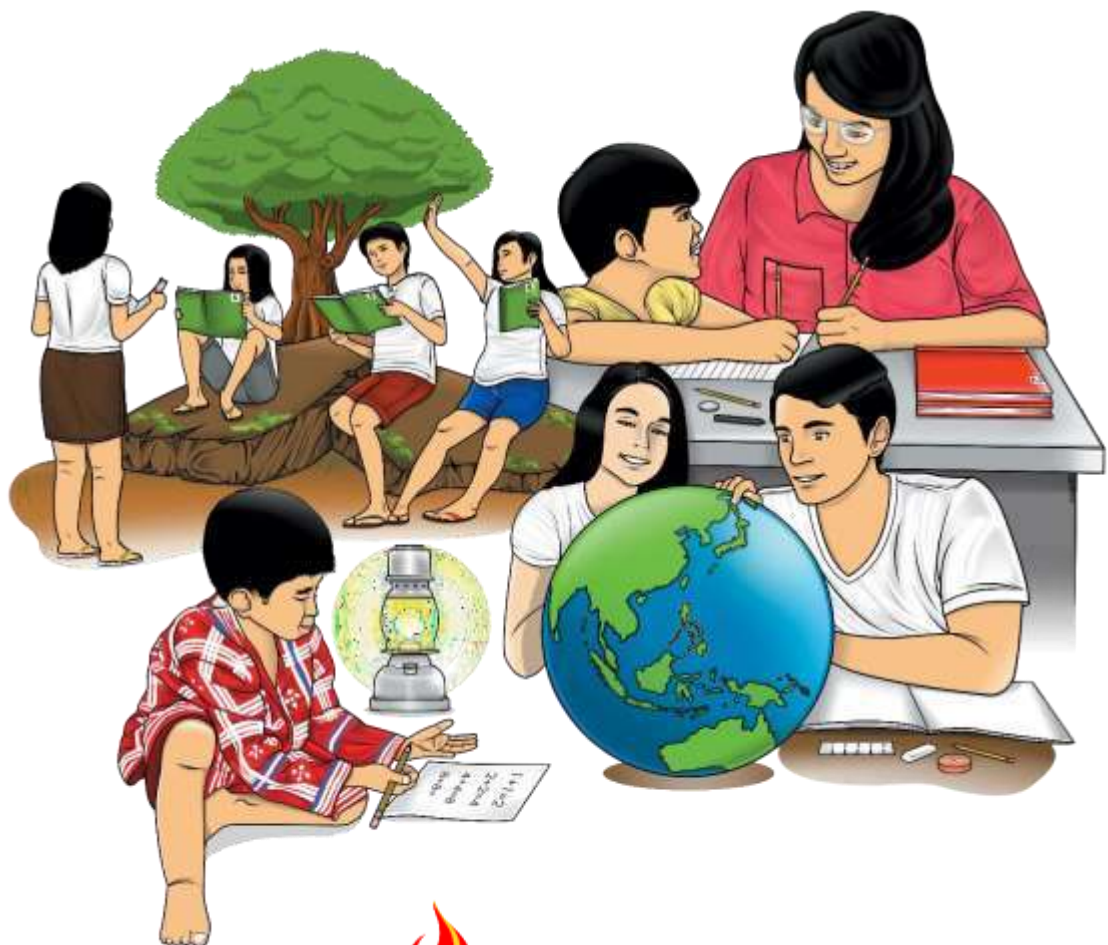


Mathematics

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



CO_Q1_MATHEMATICS 7_Module 8



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Mathematics - 7

Self-Learning Module (SLM)

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

First Edition, 2020

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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-test 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 Teachers are also provided to the 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. 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

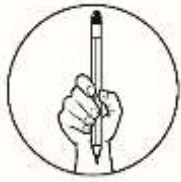
This module was designed and written with you in mind. It is here to help you master the nature of Principal Roots and Irrational Numbers. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons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



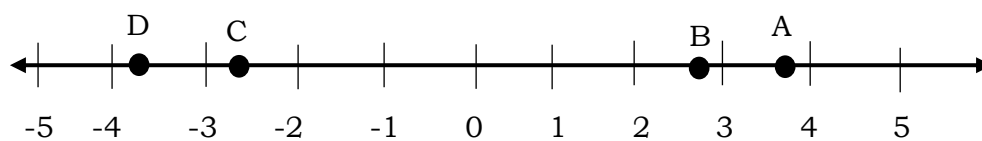
What I Know

PRE-ASSESSMENT

Find out how much you already know about this module. Read each statement carefully. Choose the letter of the best answer and 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. 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 does 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 best 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 to the given number line below.



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

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

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

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

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

- A.

A horizontal number line with arrows at both ends. It has tick marks labeled 0, 1, 2, and 3. A solid black dot is plotted at approximately 1.41, which is $\sqrt{2}$.
- B.

A horizontal number line with arrows at both ends. It has tick marks labeled 0, 1, 2, and 3. A solid black dot is plotted exactly at 2.
- C.

A horizontal number line with arrows at both ends. It has tick marks labeled 0, 1, 2, and 3. A solid black dot is plotted exactly at 1.
- D.

A horizontal number line with arrows at both ends. It has tick marks labeled 0, 1, 2, and 3. A solid black dot is plotted at approximately 1.73, which is $\sqrt{3}$.

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

- A.

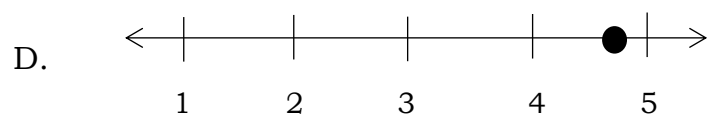
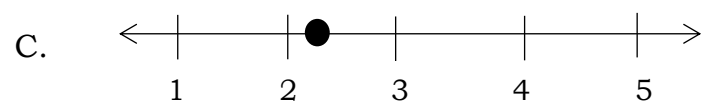
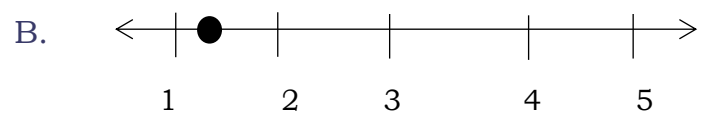
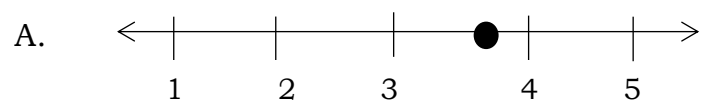
A horizontal number line with arrows at both ends. It has tick marks labeled 0, 1, 2, and 3. A solid black dot is plotted at approximately 2.24, which is $\sqrt{5}$.
- B.

A horizontal number line with arrows at both ends. It has tick marks labeled 0, 1, 2, and 3. A solid black dot is plotted at approximately 0.47, which is $\sqrt{2}$.
- C.

A horizontal number line with arrows at both ends. It has tick marks labeled 0, 1, 2, and 3. A solid black dot is plotted at approximately 1.41, which is $\sqrt{2}$.
- D.

A horizontal number line with arrows at both ends. It has tick marks labeled 0, 1, 2, and 3. A solid black dot is plotted at approximately 2.59, which is $\sqrt{6}$.

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



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 to use in looking 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 assists the players in the preparation prior to the game. He also hands 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 are 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 much 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.

$$(2.5)^2 = 6.25$$

$$(2.6)^2 = 6.76$$

$$(2.7)^2 = 7.29$$

$$(2.8)^2 = 7.84$$

← The $\sqrt{7}$ lies between 2.6 and 2.7.

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, 2.64, 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 are 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 $\sqrt{44}$ 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.

$$(6.61)^2 = 43.6921$$

$$(6.63)^2 = 43.9569$$

$$(6.62)^2 = 43.8244$$

$$(6.64)^2 = 44.0896$$

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 43.9569 compared to 44.0896. Meanwhile, 43.9569 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 are closest to 125. They are: 121 and 144 because $\sqrt{121} < \sqrt{125} < \sqrt{144}$ or $11 < \sqrt{125} < 12$.

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 to 11 than 12, we then square numbers closer to 11 with one decimal place

$$(11.1)^2 = 123.21$$

$$(11.2)^2 = 125.44$$

$$(11.3)^2 = 127.69$$

 The $\sqrt{125}$ lies between 11.1 and 11.2.

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 are closest to 263. They are: 256 and 289 because $\sqrt{256} < \sqrt{263} < \sqrt{289}$ or $16 < \sqrt{263} < 17$.

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 to 16 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 263 is 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 are 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.

$$\begin{array}{l} (8.5)^2 = 72.25 \\ (8.6)^2 = 73.96 \\ (8.7)^2 = 75.69 \end{array} \quad \begin{array}{l} \nwarrow \\ \nearrow \end{array} \quad \begin{array}{l} \text{The } \sqrt{73} \text{ lies between} \\ 8.5 \text{ and } 8.6. \end{array}$$

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.

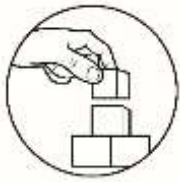
Since 73 is closer to 72.25 compared to 73.96 and 72.25 is the square of 8.5 then estimate further by squaring the numbers 8.51, 8.51, 8.53, 8.54, and 8.55

$$\begin{array}{ll} (8.51)^2 = 72.4201 & (8.54)^2 = 72.9316 \\ (8.52)^2 = 72.5904 & (8.55)^2 = 73.1025 \\ (8.53)^2 = 72.7609 & \end{array}$$

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. $\sqrt{50}$

6. $\sqrt{136}$

2. $\sqrt{89}$

7. $\sqrt{101}$

3. $\sqrt{21}$

8. $\sqrt{3}$

4. $\sqrt{143}$

9. $\sqrt{67}$

5. $\sqrt{250}$

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

A $\sqrt{99}$

E $\sqrt{38}$

W $\sqrt{123}$

G $\sqrt{87}$

L $\sqrt{198}$

H $\sqrt{201}$

11.09	14.18	9.95	14.07	6.16

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? Why or Why not?

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 of 237 square feet. What is the side length of the kitchen floor to the nearest hundredths of a foot?
2. Aevryn wants to use this tile to finish the floor in her room. The room is asquare and has a floor area of 441 square feet. She wants to put8 inches 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?
 - c. How may tiles does she need in order to cover the floor?
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 root 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. $\sqrt{2}$ | 6. $\sqrt{175}$ |
| 2. $\sqrt{7}$ | 7. $\sqrt{84}$ |
| 3. $\sqrt{28}$ | 8. $\sqrt{12}$ |
| 4. $\sqrt{150}$ | 9. $\sqrt{213}$ |
| 5. $\sqrt{41}$ | 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.

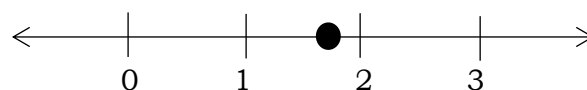


What is It

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.

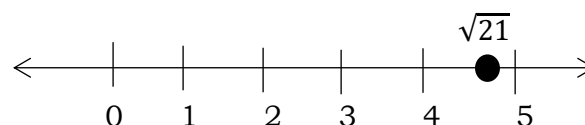
- A. Locate and plot $\sqrt{3}$ on a number line.

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.



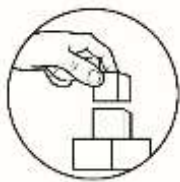
- B. Locate and plot $\sqrt{21}$ on a number line.

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 $\sqrt{87}$ on a number line.

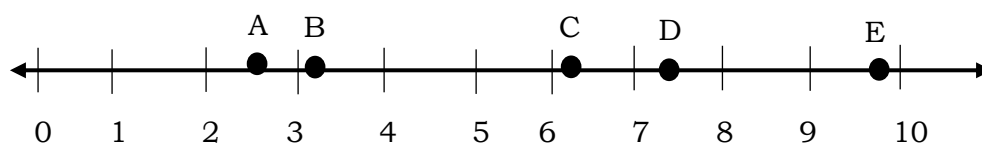
This number is between 9 and 10, principal roots of 81 and 100. Since 87 is closer to 81, $\sqrt{87}$ then is closer to 9 than to 10. Plot $\sqrt{87}$ closer to 9.



What's More

Where Am I?

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

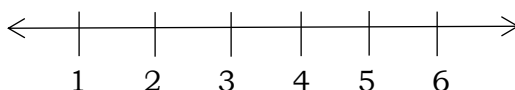


1. $\sqrt{57}$ 2. $\sqrt{6}$ 3. $\sqrt{99}$ 4. $\sqrt{38}$ 5. $\sqrt{11}$

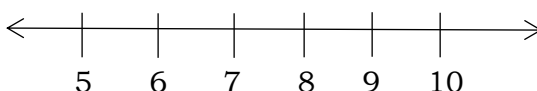
Locate Me!

Plot the points on a number line.

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



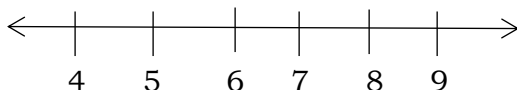
2. Point B: $\sqrt{73}$



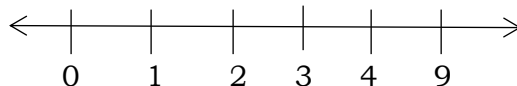
3. Point C: $\sqrt{30}$



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 dimension of the land?
2. If a square bedroom has an area of 111 square feet. What is the length of the side?
3. Mr. Cruz owns a square garden with an area of 245 square feet. How much fencing material will a gardener need to buy in order to fence the garden of Mr. Cruz if each foot of fencing material 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?

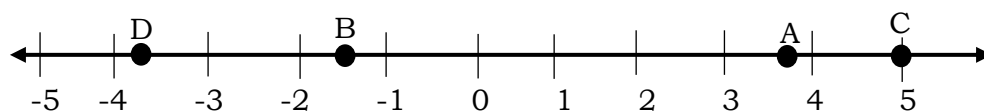


Assessment

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 square 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. 7 and 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 best 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?

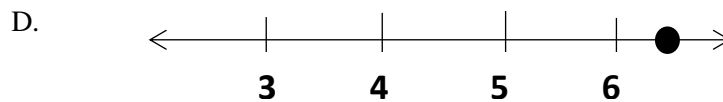
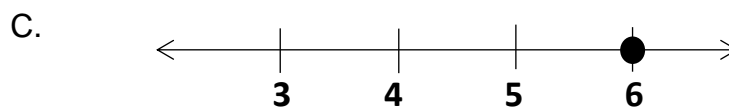
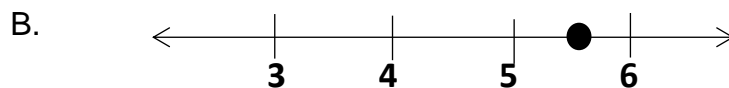
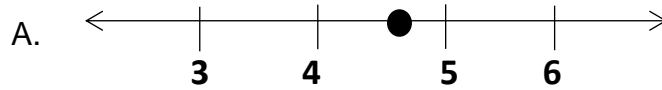
A. A

B. B

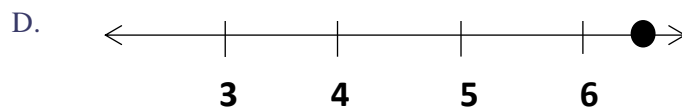
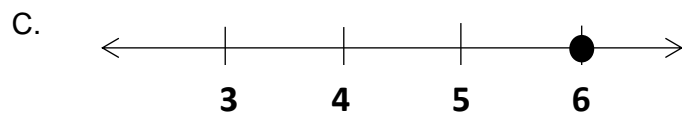
C. C

D. D

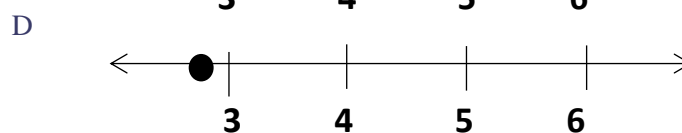
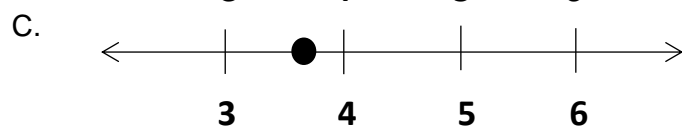
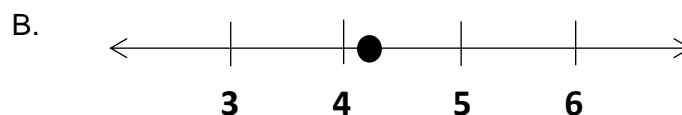
13. Locate and plot $\sqrt{32}$ on a number line.



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



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

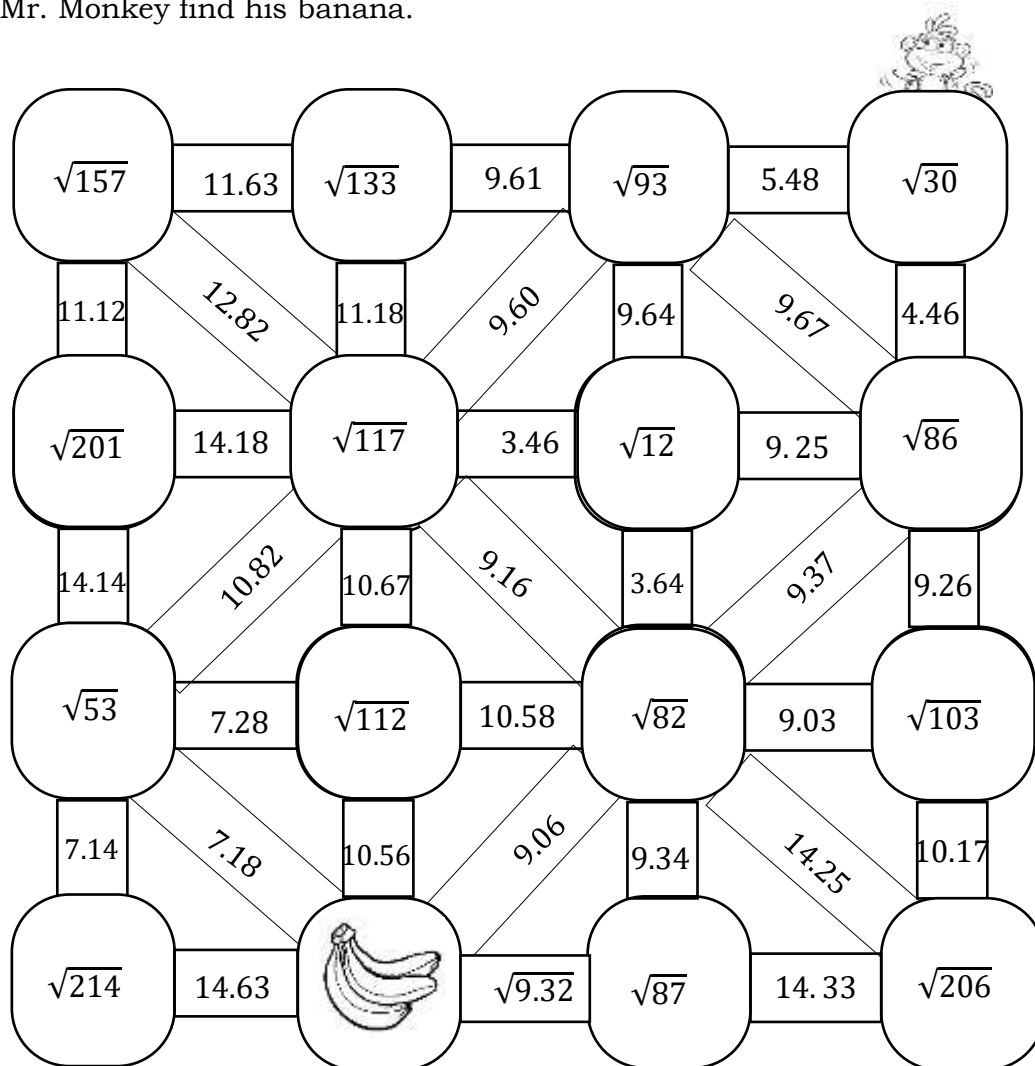




Additional Activities

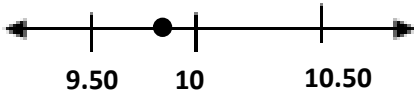
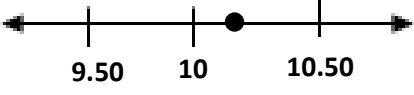

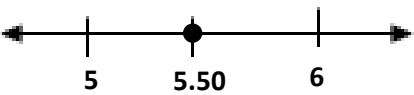
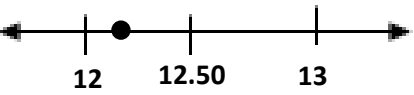
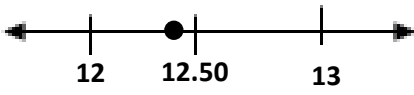
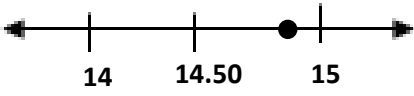
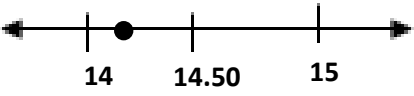
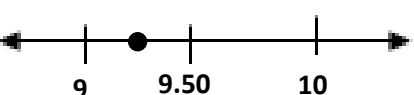
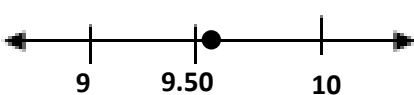
Make Your Way!

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

<p>What I Know</p> <p>Pre-Assessment</p> <ol style="list-style-type: none"> C C A C B D D B D A D B A D D 	<p>What's In</p> <p>Let's Recall</p> <ol style="list-style-type: none"> 5 8 13 10 17 20 2 3 14 10 	<p>What's New</p> <p>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.</p>	<p>What's More</p> <p>A. Estimate Me!</p> <ol style="list-style-type: none"> 7.07 9.43 4.58 11.96 15.81 11.66 10.05 1.73 8.19 14.42 <p>B. Trivia</p> <p>BLUE WHALE</p>
<p>What I Can Do</p> <ol style="list-style-type: none"> 15.39 feet a. 21 feet b. 29 feet 19.49 feet 			

Lesson 2

<p>What's In</p> <p>Let's Recall</p> <ol style="list-style-type: none"> 1 and 2 2 and 3 5 and 6 12 and 13 6 and 7 13 and 14 9 and 10 3 and 4 14 and 15 20 and 21 	<p>What's New</p> <p>1. 3.32 km</p> <p>2. 2</p> <p>3.</p>	<p>What's More</p> <p>Where I am</p> <ol style="list-style-type: none"> D A E C B <p>What I Can Do</p> <ol style="list-style-type: none"> 23.41m 10.54ft P 860.75 36.24 ft 9.75ft 	<p>What's More</p> <p>Locate Me</p>
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Additional Activities

What's wrong with me!

$\sqrt{105}$		
$\sqrt{133}$		
$\sqrt{148}$		
$\sqrt{217}$		
$\sqrt{86}$		

Additional Activities

Make a Way

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

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