Root or Between?

Use perfect squares to sort square roots.

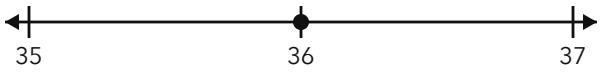
PA.N.1.4 "Compare and order real numbers; locate real numbers on a number line. Identify the square roots of perfect squares to 400 or, if it is not a perfect square root, locate it as an irrational number between two consecutive positive integers."

NAME _____ DATE _____

WHOLE-NUMBER ROOT

The dot marks the number under a square root sign. If that number is a perfect square, its positive square root is a whole number.

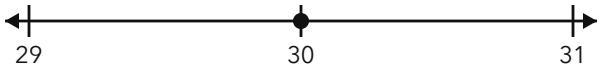
The dot marks 36. Since $6 \times 6 = 36$, $\sqrt{36} = 6$.



BETWEEN WHOLE NUMBERS

If the marked number is between two perfect squares, its positive square root is irrational. Locate the root between the roots of those perfect squares.

The dot marks 30. Since $25 < 30 < 36$, $\sqrt{30}$ is between 5 and 6.



1 SORT

8 items

For each figure, use the dotted number as the number under a square root sign, then circle WHOLE or BETWEEN.

1. 

Figure 1 **WHOLE** **BETWEEN**

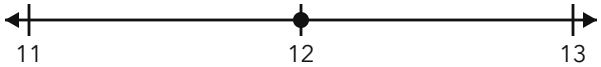
2. 

Figure 2 **WHOLE** **BETWEEN**

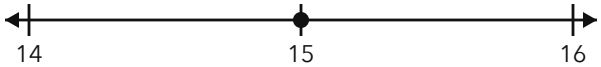
3. 

Figure 3 **WHOLE** **BETWEEN**

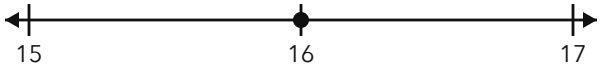
4. 

Figure 4 **WHOLE** **BETWEEN**

5.

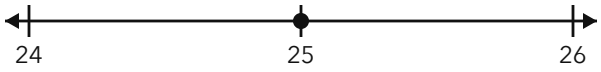


Figure 5

WHOLE **BETWEEN**

6.

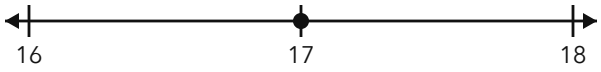


Figure 6

WHOLE **BETWEEN**

7.

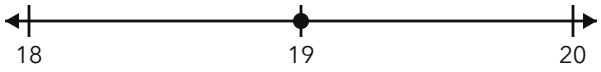


Figure 7

WHOLE **BETWEEN**

8.

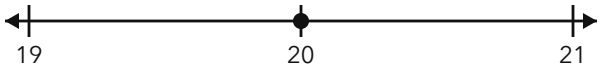


Figure 8

WHOLE **BETWEEN**

2 PROVE IT

Explain your thinking

Choose one WHOLE item and one BETWEEN item, and explain each choice using perfect squares.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

Write a new square root for each category, and give its value or the two whole numbers it falls between.

WHOLE _____

BETWEEN _____

CHALLENGE

Challenge: Without finding a decimal, place √50 between two consecutive whole numbers and explain how you know.

ANSWER KEY # Root or Between?

GRADE 8 · PA.N.1.4

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	Figure 1 (numberline)	**WHOLE**	$\sqrt{9} = 3$.
2	Figure 2 (numberline)	**BETWEEN**	$9 < 12 < 16$, so $\sqrt{12}$ is between 3 and 4.
3	Figure 3 (numberline)	**BETWEEN**	$9 < 15 < 16$, so $\sqrt{15}$ is between 3 and 4.
4	Figure 4 (numberline)	**WHOLE**	$\sqrt{16} = 4$.
5	Figure 5 (numberline)	**WHOLE**	$\sqrt{25} = 5$.
6	Figure 6 (numberline)	**BETWEEN**	$16 < 17 < 25$, so $\sqrt{17}$ is between 4 and 5.
7	Figure 7 (numberline)	**BETWEEN**	$16 < 19 < 25$, so $\sqrt{19}$ is between 4 and 5.
8	Figure 8 (numberline)	**BETWEEN**	$16 < 20 < 25$, so $\sqrt{20}$ is between 4 and 5.

PART 2 · PROVE IT

Task: Choose one WHOLE item and one BETWEEN item, and explain each choice using perfect squares. Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **WHOLE**: $\sqrt{49} = 7$ because $7 \times 7 = 49$.
- **BETWEEN**: $\sqrt{53}$ is between 7 and 8 because $49 < 53 < 64$.

Challenge: $\sqrt{50}$ is between 7 and 8 because $49 < 50 < 64$.

For Part 2, accept any one item from each category with correct perfect-square reasoning. For example, Figure 1 marks $9 = 3^2$, while Figure 2 marks 12, which lies between $9 = 3^2$ and $16 = 4^2$.