Input or Out

Sort inputs for a square-root function.

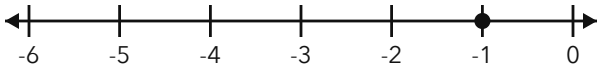
A2.F.1 "Understand functions as descriptions of covariation (how related quantities vary together). Use algebraic, interval, and set notations to specify the domain and range of various types of functions..."

NAME _____ DATE _____

IN THE DOMAIN

An input is in the real domain when the expression under the square root is zero or positive.

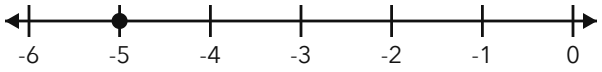
For $g(t) = \sqrt{(t + 2)}$, the marked input $t = -1$ is inside because $t + 2 = 1$.



OUTSIDE THE DOMAIN

An input is outside the real domain when the expression under the square root is negative.

For $g(t) = \sqrt{(t + 2)}$, the marked input $t = -5$ is outside because $t + 2 = -3$.



1 SORT

8 items

For $f(x) = \sqrt{(x - 4)}$, circle the category for each marked input, then choose one figure from each category and explain your choices using the value under the square root.

1.



Figure 1

INSIDE **OUTSIDE**

2.



Figure 2

INSIDE **OUTSIDE**

3.



Figure 3

INSIDE **OUTSIDE**

4.

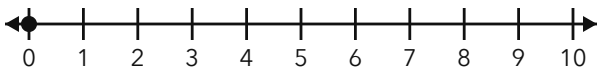


Figure 4

INSIDE **OUTSIDE**

5.



Figure 5

INSIDE **OUTSIDE**

6.



Figure 6

INSIDE **OUTSIDE**

7.



Figure 7

INSIDE **OUTSIDE**

8.



Figure 8

INSIDE **OUTSIDE**

2 PROVE IT

Explain your thinking

Choose one figure from each category and explain your choices using the value under the square root.

ITEM # _____ **HOW I KNEW** _____

ITEM # _____ **HOW I KNEW** _____

3 MAKE YOUR OWN

One of each

For h(x) = √(x + 5), write one integer input in the real domain and one integer input outside it; show the value under the square root for each.

INSIDE _____

OUTSIDE _____

CHALLENGE

For p(x) = √(2x - 5), find the greatest integer input outside the real domain and the least integer input inside it; show the value under the square root for both.

Input or Out

PART 1 · SORT

#	ITEM	CATEGORY	WHY
1	Figure 1 (numberline)	**INSIDE**	At x = 7, x - 4 = 3, which is positive.
2	Figure 2 (numberline)	**INSIDE**	At x = 4, x - 4 = 0, which is allowed.
3	Figure 3 (numberline)	**OUTSIDE**	At x = 2, x - 4 = -2, which is negative.
4	Figure 4 (numberline)	**OUTSIDE**	At x = 0, x - 4 = -4, which is negative.
5	Figure 5 (numberline)	**INSIDE**	At x = 9, x - 4 = 5, which is positive.
6	Figure 6 (numberline)	**OUTSIDE**	At x = 3, x - 4 = -1, which is negative.
7	Figure 7 (numberline)	**INSIDE**	At x = 5, x - 4 = 1, which is positive.
8	Figure 8 (numberline)	**INSIDE**	At x = 10, x - 4 = 6, which is positive.

PART 2 · PROVE IT

Task: Choose one figure from each category and explain your choices using the value under the square root.

Accept any explanation that names the deciding feature from the rule box for the chosen item.

PART 3 · MAKE YOUR OWN (SAMPLE ANSWERS)

- **INSIDE**: x = 0, since x + 5 = 5.
- **OUTSIDE**: x = -7, since x + 5 = -2.

Challenge: The greatest integer outside is 2 because 2(2) - 5 = -1. The least integer inside is 3 because 2(3) - 5 = 1.

For Part 2, explanations must use the marked input and its value of x - 4. For example, Figure 2 is inside because the value is 0, while Figure 6 is outside because the value is -1.