LESSON MAKER PRO

Radical Graph Lab

Solve radical equations and sketch square root functions.

HIGH SCHOOL · MA.912.AR.7

MA.912.AR.7 "Solve and graph radical equations and functions in one and two variables."

NAME _____ DATE _____

SOLVE, CHECK, GRAPH

To solve a radical equation, isolate the square root, square both sides, and check the result in the original equation. For y = sqrt(x - h) + k, the graph starts at (h, k), then curves to the right.

WORKED EXAMPLE

Solve sqrt(x - 11) = 7. Then plot the solution on the number line.



1. Square both sides: x - 11 = 49.
2. Add 11: x = 60.
3. Check: sqrt(60 - 11) = sqrt(49) = 7.

Answer: x = 60, plotted at 60

PRACTICE 6 problems

1 Solve sqrt(x + 3) = 5. Plot the solution on the number line.



ANSWER _____

2 Solve sqrt(x + 2) = 6.

ANSWER _____

3 Solve sqrt(3x - 2) = 4.

ANSWER _____

4 Solve sqrt(x + 4) = x - 2. Check for an extraneous solution.

ANSWER _____

5 Solve sqrt(x + 1) = x - 1. Check for an extraneous solution.

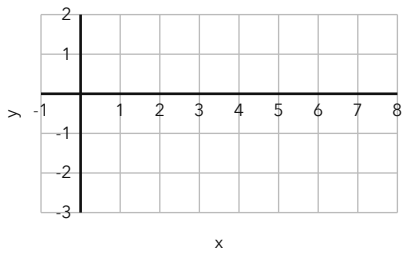
ANSWER _____

6 For y = sqrt(x - 2) - 3, state the domain and range.

ANSWER _____

APPLY IT Show your work

1 A student codes a game character's path with y = sqrt(x + 1) - 2. Use the grid to graph the path by plotting the points for x = -1, 0, 3, and 8. Then state the starting point of the path.



ANSWER _____

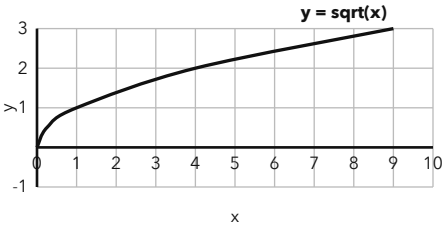
2 A robotics team uses the calibration model S = sqrt(x + 9), where x is an input setting. The sensor must have a score of 8. Find x.

WORK SPACE

ANSWER _____

CHALLENGE One step up

The solid curve on the grid is y = sqrt(x). On the same grid, graph y = -sqrt(x - 1) + 2. State the endpoint and give four points on your new graph.



WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve sqrt(x + 3) = 5. Plot the solution on the number line.	**x = 22, plotted at 22**
2	Solve sqrt(x + 2) = 6.	**x = 34**
3	Solve sqrt(3x - 2) = 4.	**x = 6**
4	Solve sqrt(x + 4) = x - 2. Check for an extraneous solution.	**x = 5**
5	Solve sqrt(x + 1) = x - 1. Check for an extraneous solution.	**x = 3**
6	For y = sqrt(x - 2) - 3, state the domain and range.	**Domain: x >= 2; Range: y >= -3**

PART 2 · APPLY IT

1. **Plot (-1, -2), (0, -1), (3, 0), and (8, 1), then draw an increasing square root curve. Starting point: (-1, -2).** Substitute each listed x-value into y = sqrt(x + 1) - 2. The graph begins where the expression inside the square root is 0.
2. **x = 55** Set sqrt(x + 9) equal to 8 and square both sides. Then subtract 9 from 64.

CHALLENGE

Endpoint: (1, 2). Four points: (1, 2), (2, 1), (5, 0), and (10, -1).

Accept equivalent domain and range notation, including [2, infinity) and [-3, infinity). For equation problems, accept only values that check in the original radical equation.