LESSON MAKER PRO

Radical Route

Solve radical equations and plot 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 _____

SQUARE, THEN CHECK

To solve a square-root equation, isolate the radical, square both sides, and check each result in the original equation. For y = sqrt(x - h) + k, the graph begins at (h, k), then curves to the right through points made by perfect-square inputs.

WORKED EXAMPLE

Solve sqrt(x - 12) = 4.

1. The radical is already isolated.
2. Square both sides: x - 12 = 16.
3. Add 12 to both sides: x = 28.
4. Check: sqrt(28 - 12) = 4.

Answer: x = 28

PRACTICE 6 problems

1 Solve sqrt(x + 2) = 3.

ANSWER _____

2 Solve sqrt(3x - 1) = 5.

ANSWER _____

3 Solve sqrt(x + 6) = x.

ANSWER _____

4 Solve sqrt(2x + 7) = 9.

ANSWER _____

5 Graph y = sqrt(x - 6) + 3. Give the starting point and three additional points.

ANSWER _____

6 Graph y = -sqrt(x + 2) + 5. Give the starting point and three additional points.

ANSWER _____

APPLY IT Show your work

1 A music festival app gives a creator a visibility score of v = sqrt(n + 13), where n is the number of new followers gained that day. If v = 8, how many new followers did the creator gain?

WORK SPACE

ANSWER _____

2 A drone club models a drone's altitude with y = sqrt(x - 10) + 6, where x is horizontal distance in meters. Graph the function by giving its starting point and three additional points.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve sqrt(x + 3) = x - 3. Explain why one value found after squaring must be rejected.

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ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve sqrt(x + 2) = 3.	**x = 7**
2	Solve sqrt(3x - 1) = 5.	**x = 26/3**
3	Solve sqrt(x + 6) = x.	**x = 3**
4	Solve sqrt(2x + 7) = 9.	**x = 37**
5	Graph y = sqrt(x - 6) + 3. Give the starting point and three additional points.	**Starting point: (6, 3). Additional points: (15, 6), (31, 8), (42, 9).**
6	Graph y = -sqrt(x + 2) + 5. Give the starting point and three additional points.	**Starting point: (-2, 5). Additional points: (7, 2), (23, 0), (34, -1).**

PART 2 · APPLY IT

1. **51 new followers** Square both sides to get n + 13 = 64. Subtract 13, so n = 51.
2. **Starting point: (10, 6). Additional points: (11, 7), (19, 9), (35, 11).** The graph starts when x - 10 = 0, so the starting point is (10, 6). Use values of x - 10 that are perfect squares to find more points.

CHALLENGE

x = 6. Squaring gives x = 1 or x = 6, but x = 1 is extraneous because the left side is positive while the right side is negative.

Accept equivalent coordinate lists in any order, as long as the points lie on the function. For equations, require students to reject extraneous solutions after checking in the original equation.