LESSON MAKER PRO

Between Two Squares

Estimate positive solutions to equations with squares.

GRADE 8 · 8A.AF.G.20.a

8A.AF.G.20.a "Find the approximate solutions of an equation graphically, using tables of values, or finding successive approximations, using technology where appropriate."

NAME _____ DATE _____

FIND THE NEAREST TENTH

To estimate a positive solution to $x^2 = n$, square nearby numbers until you find where x belongs. To round x to the nearest tenth, square the number halfway between two tenths. That midpoint tells you which tenth is closer to x.

WORKED EXAMPLE

Estimate the positive solution to $x^2 = 11$ to the nearest tenth.

1. $3^2 = 9$ and $4^2 = 16$, so x is between 3 and 4.
2. $3.3^2 = 10.89$, which is less than 11.
3. $3.35^2 = 11.2225$, which is greater than 11. So $3.3 < x < 3.35$.

Answer: x ≈ 3.3

PRACTICE 6 problems

1 Use the table to estimate the positive solution to $x^2 = 6$ to the nearest tenth.

NEARBY SQUARES

x	x^2
2.4	5.76
2.45	6.0025
2.5	6.25

ANSWER _____

2 Use the table to estimate the positive solution to $x^2 = 8$ to the nearest tenth.

NEARBY SQUARES

x	x^2
2.8	7.84
2.85	8.1225
2.9	8.41

ANSWER _____

3 Use the table to estimate the positive solution to $x^2 = 13$ to the nearest tenth.

NEARBY SQUARES

x	x^2
3.6	12.96
3.65	13.3225
3.7	13.69

ANSWER _____

4 Square nearby numbers to estimate the positive solution to $x^2 = 15$ to the nearest tenth.

ANSWER _____

5 Square nearby numbers to estimate the positive solution to $x^2 = 24$ to the nearest tenth.

ANSWER _____

6 Square nearby numbers to estimate the positive solution to $x^2 = 37$ to the nearest tenth.

ANSWER _____

APPLY IT Show your work

1 A square mural at a skate park has an area of 29 square feet. About how long is each side, to the nearest tenth of a foot? Show the two squaring checks you use to round.

WORK SPACE

ANSWER _____

2 A square sticker for a laptop has an area of 42 square centimeters. About how long is each side, to the nearest tenth of a centimeter? Show the two squaring checks you use to round.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Find the positive solution to $(x + 2)^2 = 23$ to the nearest tenth. Explain how you know which tenth to choose.

WORK SPACE AND ANSWER

Between Two Squares

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use the table to estimate the positive solution to $x^2 = 6$ to the nearest tenth.	**x ≈ 2.4**
2	Use the table to estimate the positive solution to $x^2 = 8$ to the nearest tenth.	**x ≈ 2.8**
3	Use the table to estimate the positive solution to $x^2 = 13$ to the nearest tenth.	**x ≈ 3.6**
4	Square nearby numbers to estimate the positive solution to $x^2 = 15$ to the nearest tenth.	**x ≈ 3.9**
5	Square nearby numbers to estimate the positive solution to $x^2 = 24$ to the nearest tenth.	**x ≈ 4.9**
6	Square nearby numbers to estimate the positive solution to $x^2 = 37$ to the nearest tenth.	**x ≈ 6.1**

PART 2 · APPLY IT

1. **5.4 feet** $5.35^2 = 28.6225 < 29$ and $5.45^2 = 29.7025 > 29$. The side length is between 5.35 and 5.45 feet, so it rounds to 5.4 feet.
2. **6.5 centimeters** $6.45^2 = 41.6025 < 42$ and $6.55^2 = 42.9025 > 42$. The side length is between 6.45 and 6.55 centimeters, so it rounds to 6.5 centimeters.

CHALLENGE

x ≈ 2.8. Since $4.75^2 = 22.5625 < 23$ and $4.85^2 = 23.5225 > 23$, x is between 2.75 and 2.85, so it rounds to 2.8.

Accept equivalent rounding checks that place a solution between the appropriate hundredths ending in 5. All answers refer to positive solutions.