LESSON MAKER PRO

Number Line Detective

Find where real numbers belong

GRADE 8 · 8A.NS.A

8A.NS.A "Together, irrational numbers and rational numbers complete the real number system, representing all points on the number line, while there exist numbers beyond the real numbers called complex numbers."

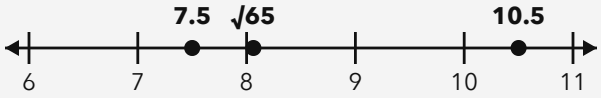
NAME _____ DATE _____

REAL OR BEYOND?

A rational number can be written as a fraction of integers. The square root of a whole number that is not a perfect square is irrational. Rational and irrational numbers are real and have points on the number line; a number such as √(-1) is complex but not real.

WORKED EXAMPLE

Which plotted label is irrational? Between which whole numbers does it fall?



1. 65 is not a perfect square, so √65 is irrational.
2. $8^2 = 64$ and $9^2 = 81$.
3. Since $64 < 65 < 81$, the √65 point falls between 8 and 9.

Answer: √65; between 8 and 9

PRACTICE 4 problems

1 Classify √49 as rational or irrational.

ANSWER _____

2 Classify √30. Between which consecutive whole numbers does it fall?

ANSWER _____

3 Classify -11/4 as rational, irrational, or complex but not real.

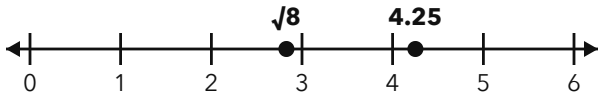
ANSWER _____

4 Is √(-25) real or complex but not real?

ANSWER _____

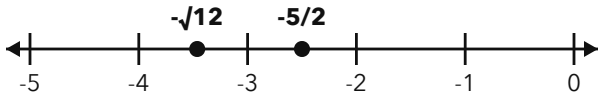
APPLY IT Show your work

1 A skate park plots two ramp lengths in meters. Which plotted length is irrational? Between which whole meters does it fall?



ANSWER _____

2 Two players' score changes are plotted below. Which change is farther from zero? Is it rational or irrational?



ANSWER _____

CHALLENGE One step up

A student says every number that is not rational is irrational. Is the student correct? Explain using √(-36) and √18.

WORK SPACE AND ANSWER

ANSWER KEY

Number Line Detective

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Classify √49 as rational or irrational.	**Rational**
2	Classify √30. Between which consecutive whole numbers does it fall?	**Irrational; between 5 and 6**
3	Classify -11/4 as rational, irrational, or complex but not real.	**Rational**
4	Is √(-25) real or complex but not real?	**Complex but not real**

PART 2 · APPLY IT

1. **√8; between 2 and 3 meters** 8 is not a perfect square, so √8 is irrational. Since $4 < 8 < 9$, its point falls between 2 and 3.
2. **-√12; irrational** $\sqrt{12} > 3 > 5/2$, so $-\sqrt{12}$ is farther from zero. Since 12 is not a perfect square, $-\sqrt{12}$ is irrational.

CHALLENGE

No. √18 is irrational and real, but √(-36) is complex and not real, so it is neither rational nor irrational.

Accept equivalent wording for number classifications. For the score problem, accept a correct comparison of distances from zero without decimal approximations.