LESSON MAKER PRO

Numbers on the Line

Find, compare, and classify real numbers.

HIGH SCHOOL · A2S.NQ.A

A2S.NQ.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."

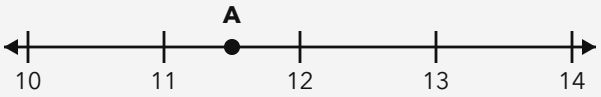
NAME _____ DATE _____

THE BIG IDEA

A rational number can be written as a fraction of integers. The square root of a positive whole number that is not a perfect square is irrational. Both kinds of numbers lie on the real number line, but the square root of a negative number is not real.

WORKED EXAMPLE

Write point A as a fraction. Is it rational or irrational?



1. A is halfway between 11 and 12.
2. A = 11 + 1/2 = 23/2.
3. 23/2 is a fraction of integers, so it is rational.

Answer: 23/2; rational

PRACTICE 4 problems

1 Find √49. Is it rational or irrational?

ANSWER _____

2 Between which consecutive integers is √18? Is it rational or irrational?

ANSWER _____

3 Is √(-9) real? Explain briefly.

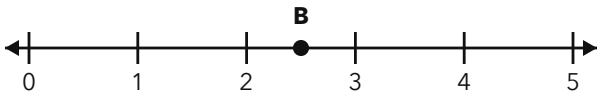
ANSWER _____

4 Write 0.375 as a fraction in lowest terms. Is it rational or irrational?

ANSWER _____

APPLY IT Show your work

1 The number line shows seconds of a music clip. At B, what fraction of a second has passed? Is that time rational?



ANSWER _____

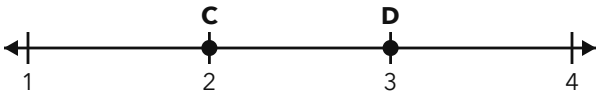
2 A square game tile has an area of 32 cm^2. Its side is $\sqrt{32}$ cm long. Between which consecutive whole centimeters is its length? Is $\sqrt{32}$ rational?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Which point is closer to $\sqrt{8}$, C or D? Justify without decimals.



WORK SPACE AND ANSWER

ANSWER KEY

Numbers on the Line

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Find √49. Is it rational or irrational?	**7; rational**
2	Between which consecutive integers is √18? Is it rational or irrational?	**Between 4 and 5; irrational**
3	Is √(-9) real? Explain briefly.	**No. The square of a real number cannot be negative.**
4	Write 0.375 as a fraction in lowest terms. Is it rational or irrational?	**3/8; rational**

PART 2 · APPLY IT

1. **5/2 seconds; rational** B is halfway between 2 and 3, so its value is 2 + 1/2 = 5/2.
2. **Between 5 and 6 cm; irrational** Since 25 < 32 < 36, the side is between 5 and 6 cm. Because 32 is not a perfect square, √32 is irrational.

CHALLENGE

D. The midpoint of C and D is 5/2. Since $8 > (5/2)^2 = 25/4$, √8 is greater than 5/2 and closer to D.

Accept equivalent fractions. For the challenge, accept any correct comparison that shows √8 is closer to 3 than to 2.