

**8.NS.1** Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

Which of the following is true about the decimal expansion of  $\frac{1}{11}$ ?

$$\begin{array}{r} 00909 \\ 11 \overline{) 1.00} \\ \underline{99} \\ 100 \end{array}$$

- A. ends in 625
- B. 3 repeating
- C. 09 repeating
- D. 27 repeating

Which of the following sets contains only irrational numbers?

- A.  $\pi, \sqrt{2}, 4.238905 \dots$
- B.  $\frac{1}{7}, 3.14, 5$
- C.  $2\frac{1}{4}, \sqrt{5}, 7.717$
- D.  $0.\overline{1}, 0.\overline{09}, 0.1\overline{6}$

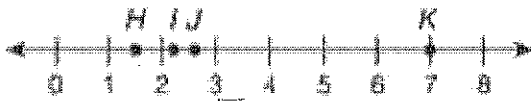
Which of the following fractions does not end with a decimal expansion of zeros?

- A.  $\frac{1}{3} = .\overline{3}$
- B.  $\frac{1}{4} = .25$
- C.  $\frac{1}{5} = .2$
- D.  $\frac{1}{8} = .125$

A flagpole measures  $25\frac{1}{11}$  feet tall. Which repeating decimal represents this height?

- A.  $25.08\overline{3}$  feet
- B.  $25.\overline{09}$  feet
- C.  $25.\overline{1}$  feet
- D.  $25.1\overline{6}$  feet

Points H, I, J, and K are plotted on the number line below.



Which point on the number line represents  $\sqrt{7}$ ?

- A. H
- B. I
- C. J
- D. K

Which number is irrational?

- A.  $\frac{1}{8}$
- B.  $2.2\overline{5}$
- C.  $\sqrt{9}$
- D.  $10\pi$

A middle school with 375 students has 125 in the eighth grade. Irene says that the eighth-grade class makes up  $0.\overline{1}$  of the school. Yolanda says the eighth-grade class makes up  $0.\overline{3}$  of the school. Fernando says that the eighth-grade class makes up  $0.\overline{6}$  of the school.

Part A: Convert each student's decimal into a fraction.

$$0.\overline{1} = \frac{1}{9} \quad 0.\overline{3} = \frac{3}{9} = \frac{1}{3} \quad 0.\overline{6} = \frac{6}{9} = \frac{2}{3}$$

Part B: Which student's decimal is correct? How do you know?

$$\frac{125}{375} \div \frac{25}{25} = \frac{5}{15} = \frac{1}{3} = .\overline{3} \text{ - Yolanda}$$

Part C: Which student's decimal represents the population of the rest of the middle school instead of the eighth-grade class? Explain your reasoning.

$$375 - 125 = \frac{250}{375} = \frac{10}{15} = \frac{2}{3} = .\overline{6} \text{ (Fernando)}$$

**S.NS.1** know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.

Which of the following is an irrational number?

- A.  $\sqrt{21}$  (non perfect  $\sqrt{\quad}$ )
- B.  $2.59 \times 10^5$
- C.  $\sqrt{81}$
- D.  $\frac{-1}{3}$

Select all the irrational numbers.

- $\frac{3}{2}$  Rational fraction
- 1.5 R-terminating decimal
- $\frac{1}{9}$  R-fraction
- 1.414213... non terminating & non repeating
- 0. $\overline{45}$  R-repeating dec.
- 3.14159... non terminating & non-repeating

Which of the fractions shown below represents the repeating decimal  $0.\overline{25}$ ?

- A.  $\frac{9}{25}$
- B.  $\frac{25}{99}$
- C.  $\frac{99}{25}$
- D.  $\frac{25}{9}$

Write the rational number  $\frac{3}{8}$  in decimal form:

- A. 2.67
- B. 0.338
- C. 8.3
- D. 0.375

$$\begin{array}{r} 0.375 \\ 8 \overline{) 3} \\ \underline{24} \phantom{0} \\ 30 \phantom{0} \\ \underline{24} \phantom{0} \\ 60 \\ \underline{56} \\ 40 \\ \underline{40} \\ 0 \end{array}$$

**Part A**

Explain in your own words what it means for a number to be rational. Provide two examples of numbers that are rational and two examples of numbers that are irrational.

Rational numbers can be written as a fraction  
 EX.  $\frac{45}{99}$  or 3.75      Irrational:  $\pi$ ,  $\sqrt{8}$

**Part B**

Would the quotient of  $35 \div 11$  be considered rational or irrational? Explain how you know.

$$\frac{35}{11} = 11 \overline{) 35} = 3.\overline{18} \text{ rational}$$

**Part C**

What is the decimal equivalent to the quotient of  $35 \div 11$  from Part B? Show your work.

$$\begin{array}{r} 3.18 \\ 11 \overline{) 35} \\ \underline{33} \phantom{0} \\ 20 \phantom{0} \\ \underline{18} \phantom{0} \\ 20 \phantom{0} \\ \underline{18} \phantom{0} \\ 20 \phantom{0} \\ \underline{18} \phantom{0} \\ 20 \phantom{0} \end{array}$$

\*repeating pattern begins.