Unit 7 Lesson 20: Quadratics and Irrationals

1 Where is $\sqrt{21}$? (Warm up)
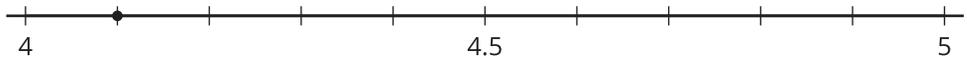
Student Task Statement

Which number line accurately plots the value of $\sqrt{21}$? Explain your reasoning.
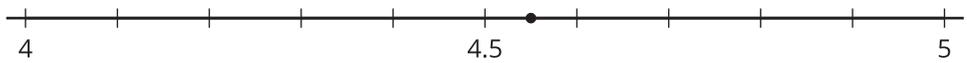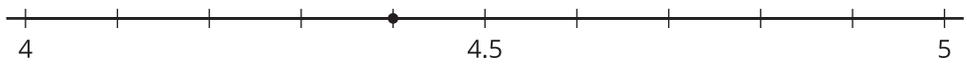
A

B

C

D

2 Some Rational Properties

Student Task Statement

Rational numbers are fractions and their opposites.

1. All of these numbers are rational numbers. Show that they are rational by writing them in the form $\frac{a}{b}$ or $-\frac{a}{b}$ for integers a and b.

   a. 6.28

   b. $-\sqrt{81}$

   c. $\sqrt{\frac{4}{121}}$

   d. -7.1234

   e. $0.\overline{3}$

   f. $\frac{1.1}{13}$

2. All rational numbers have decimal representations, too. Find the decimal representation of each of these rational numbers.

   a. $\frac{47}{1,000}$

   b. $-\frac{12}{5}$

   c. $\frac{\sqrt{9}}{6}$

   d. $\frac{53}{9}$

   e. $\frac{1}{7}$

3. What do you notice about the decimal representations of rational numbers?

3 Approximating Irrational Values

Student Task Statement

Although $\sqrt{2}$ is irrational, we can approximate its value by considering values near it.

1. How can we know that $\sqrt{2}$ is between 1 and 2?

2. How can we know that $\sqrt{2}$ is between 1.4 and 1.5?

3. Approximate the next decimal place for $\sqrt{2}$.

4. Use a similar process to approximate the $\sqrt{5}$ to the thousandths place.

Activity Synthesis