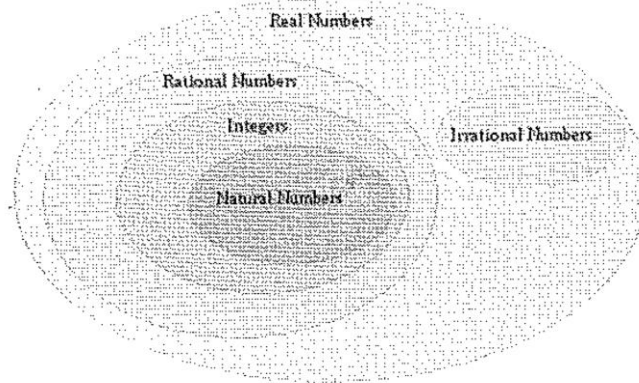


## Rational and Irrational Numbers Answer Key

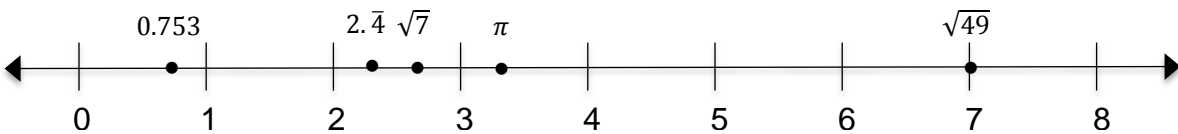
1. Explain the relationship between all categories of rational numbers with irrational numbers. Draw a Venn diagram to show the relationships.



2. Which of the following numbers are irrational. Explain your reasoning.

a.  $\sqrt{49}$       b.  $\sqrt{7}$       c. 0.753      d.  $2.\bar{4}$       e.  $\pi$

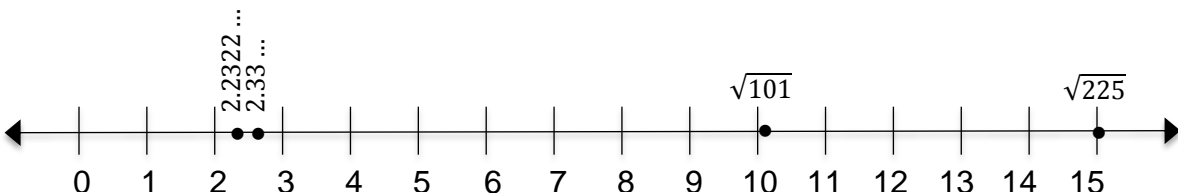
Both  $\sqrt{7}$  and  $\pi$  are irrational because neither can be written as a fraction, and the decimals are non-repeating and non-terminating.



3. Indicate which are rational and which are irrational. Explain your reasoning.

a. 2.23223222322223...      b. 2.3333...      c.  $\sqrt{101}$       d.  $\sqrt{225}$

Choice b is rational because you can write  $2.3333\dots$  as  $2\frac{1}{3}$ , and choice d is rational because  $\sqrt{225} = 15$ . Choices a and c are irrational because neither can be written as a fraction, and the decimals are non-repeating and non-terminating.



4. Is it possible to find the exact area and circumference of a circle? Explain your answer.

No, it is not possible to find the *exact* area and circumference of a circle. The irrational number  $\pi$  is used to find both area and circumference. As we use the approximation 3.14 for  $\pi$ , we will find a fairly accurate – but not exact – area and circumference.

5. Your house is 28.5 feet tall. Your neighbor's house is  $8\frac{2}{3}$  yard tall. Who has the taller house?

Your house is taller than your neighbor's house.

6. Manuel, Rocky, and Cindy are on the same little league baseball team. During the last game, Manuel made 3 hits out of 5 times at bat; Rocky had 4 hits at 6 times at bat; Cindy had 5 hits at 6 times at bat. In baseball, hitting averages are displayed in thousandths. What is the batting average of each individual?

Manuel = 0.600

Rocky = 0.667

Cindy = 0.833