

Instructor: Wenqiang Feng

Name:: _____ solutions _____

Using what you have learned answer the following questions. Show all work if you want partial credit. If a specific method is mentioned, make sure you show that you are using that method.

- (1) (5 points) Prove that $3.\overline{3217}$ is a rational number.

Solution. Let $x = 3.\overline{3217}$, then we have

$$\begin{aligned} 1000 * x &= 3321.7217217217217 \\ x &= 3.3217217217217. \end{aligned}$$

So,

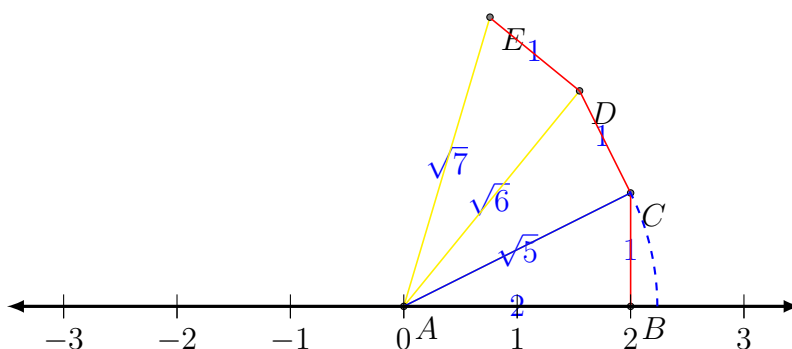
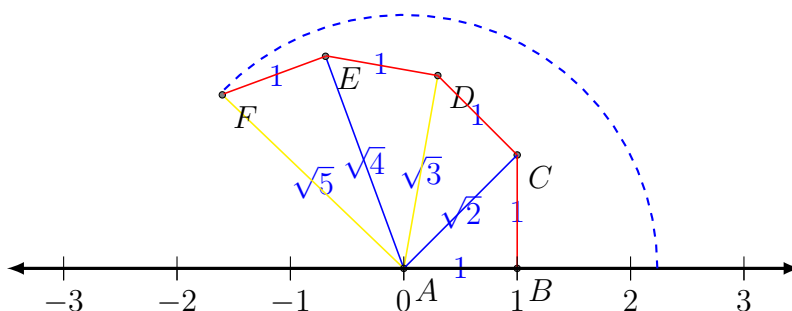
$$999x = 3318.4.$$

Hence,

$$x = \frac{3318.4}{999} = \frac{33184}{9990} = \frac{16592}{4995} = 3.\overline{3217}.$$

Therefore, $3.\overline{3217}$ is a rational number. ◀

- (2) (5 points) Plot the irrational number $\sqrt{5}$ on number line.



- (3) (Bonus 2 points) Describe ∞ by using your own words.