January 13, 2015

1.1

#20) $0.\overline{882}$

a.) Let $x = 0.\overline{882}$

b.) $1000x = 882.\overline{882}$

c.) $1000x = 882.\overline{882}$

$-\quad x = \quad 0.\overline{882}$

$999x = 882$

$\frac{999x}{999} = \frac{882}{999}$

$x = \frac{882}{999} = \frac{294}{333} = \boxed{\frac{98}{111}}$

So, $0.\overline{882} = \frac{98}{111}$

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$\mathbb{Q} = \left\{ \frac{m}{n} \mid m \text{ \& } n \text{ are Integers and } n \neq 0 \right\}$

$\mathbb{N} = \{1, 2, 3, \ldots\}$

Prime Numbers!

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* Proof by Contradiction

① Prove that $\sqrt{7}$ is Irrational.

② Assume that $\sqrt{7}$ is Rational.

$\left(\sqrt{7}\right)^2 = \left(\frac{m}{n}\right)^2$

$7 = \frac{m^2}{n^2}$ → GCD

* Clear eq containing fractions by multiplying denom through to get rid of fractions

$n^2 \cdot 7 = n^2 \cdot \frac{m^2}{n^2}$

$7n^2 = m^2$ * no fractions!

$7 \cdot n \cdot n \neq m \cdot m$

* a Contradiction!

So, our assumption is incorrect!

therefore, $\sqrt{7}$ is Irrational ∎

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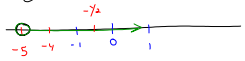
1.3 Logic

Set Notation

write all numbers greater than −5.



① Set-Builder Notation

$\{x \mid$ such that what? $\}$

:

such that

$\{x \mid x > -5\}$

$\mathbb{N}, \mathbb{W}, \mathbb{Z}, \mathbb{Q}, \mathbb{Q}', \mathbb{R}$

$\{x \mid x \in \mathbb{Z} \text{ \& } x > -5\}$

↑ Element of

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$\{x \mid x \in \mathbb{Q} \text{ \& } x > -5\}$

$\{x \mid x \in \mathbb{N} \text{ \& } x > -5\}$

$\{1, 2, 3, \ldots\}$

* Read 1.3 COR

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