

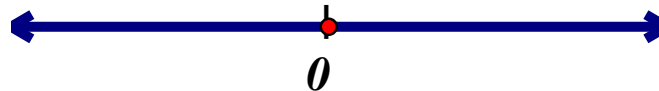
1A: Intervals - Solutions

Represent each set of numbers using Set-builder notation, interval notation, and a graph unless instructed otherwise.

1. The set of all numbers such that $x^2 + 1$ is positive.

$$\{x|x \in \mathbb{R}\}$$

$$(-\infty, \infty)$$



2. The set of all numbers such that \sqrt{x} is a real number.

$$\{x|x \in \mathbb{R}, x \geq 0\}$$

$$[0, \infty)$$



3. The set of all numbers such that $1 - |x|$ is positive.

$$\{x|x \in \mathbb{R}, -1 < x < 1\}$$

$$(-1, 1)$$



4. The set of all numbers such that $1 - |x|$ is negative.

$$\{x|x \in \mathbb{R}, x < -1 \text{ or } x > 1\}$$

$$(-\infty, -1) \cup (1, \infty)$$



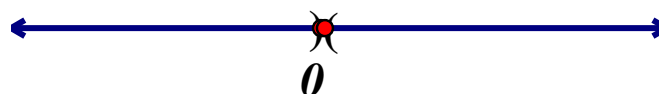
5. The set of all numbers such that x^2 is a positive number
(Note: 0 is neither positive or negative).

$$\{x|x \in \mathbb{R}, x \neq 0\}$$

Or

$$\{x|x \in \mathbb{R}, x < 0 \text{ or } x > 0\}$$

$$(-\infty, 0) \cup (0, \infty)$$



Pre-Calculus

Name: _____

Date: _____

Period: _____

6. James has a cell phone plan that includes 250 texts per month but charges \$.50 for each text over this limit.

A. Use set builder notation to describe the set of all possible monthly totals that would not result in extra charges.

$$\{x | x \text{ is an Integer}, 0 \leq x \leq 250\}$$

or

$$\{x | x \in \mathbb{Z}, 0 \leq x \leq 250\}$$

B. Use set builder notation to describe the set of all possible monthly totals that would result in extra charges.

$$\{x | x \text{ is an Integer}, x > 250\}$$

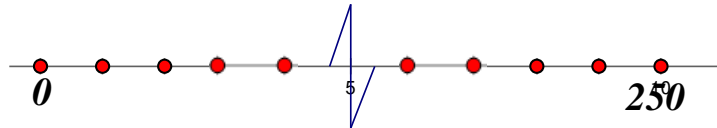
or

$$\{x | x \in \mathbb{Z}, x > 250\}$$

C. Why does interval notation not work well to describe these sets?

Interval Notation usually represents all Real numbers in an interval.

D. How could you accurately graph the set in part(a)?



7. Cammie has a cell phone plan that includes 250 minutes of calls per month but charges \$.50 for any calling time over this limit.

A. Describe the set of all possible monthly call totals that would not result in extra charges as an interval, set-builder, and graph.

$$\{x | x \in \mathbb{R}, 0 \leq x \leq 250\}$$

$$[0, 250]$$



B. Describe the set of all possible monthly call totals that would result in extra charges as an interval, set-builder, and graph.

$$\{x | x \in \mathbb{R}, x > 250\}$$

$$(250, \infty)$$



C. Why does interval notation work well to describe these sets?

The set includes all real numbers in the interval.

i.e. you can talk for exactly 3.1415926535 minutes if you want (if you're hungry for pi)!