

Section 1.5: Set Notation and Types of Numbers

Set Notation

1. A set is a group or collection. We list the elements of a set in _____.
 - a. What numbers can you roll on a 6-sided die? Write them in set notation.

 - b. How many cats can a person have? Write the elements in set notation.

 - c. Write the set of U.S. shoes sizes.

Sets of Numbers

2. List the sets of numbers and their notation.

<div style="border: 1px solid black; width: 80%; margin: 10px auto; padding: 5px;"><div style="border: 1px solid black; width: 80%; margin: 10px auto; padding: 5px;"><div style="border: 1px solid black; width: 80%; margin: 10px auto; padding: 5px;"></div></div></div>	
---	--

3. Where do decimals fit in the sets of numbers?

Repeating Decimals

Terminating Decimals

Not repeating and Not Terminating

4. Identify which sets each number belongs to.

a. $-\frac{3}{5}$

b. π

c. $\sqrt{49}$

d. $1.\overline{852}$

5. Give an example of each. If no such number exists, write none or does not exist (DNE).

a. Rational, but not a whole number.

b. A real number, but not an integer.

c. An integer, but not a natural number.

6. Which set of numbers is best used when describing each scenario?

a. The number of pets in your household.

b. The amount of money someone earns at a casino.

Section 1.6: Comparison Symbols

7. Write the name of each symbol and give an example of how it is used.

<

≤

>

≥

=

≠

≈

8. Write < , > , or = to make a true statement.

a. $-4 \square 5$

b. $\frac{2}{5} \square -\frac{7}{5}$

c. $\frac{1}{2} \cdot \frac{1}{2} \square \frac{1}{2} + \frac{1}{2}$

d. $|-4| \square -|-4|$

e. $\frac{3}{4} \square 0.75$

f. $\frac{4}{9} \square 0.4$

9. Write whether each comparison is true or false.

a. $-4.5 \neq -\frac{9}{2}$

b. $-1 \leq 0$

c. $-3\frac{1}{4} \leq -3\frac{1}{2}$

10. Use the > symbol to arrange the following numbers in order from greatest to least.

$$2.5, -\frac{3}{4}, \sqrt{16}, 0, -2$$

Section 1.7: Interval and Set-Builder Notation

Variables

A variable is a letter that we use to represent an unknown quantity. The variable x is the most common, but any letter can be used. We must define what the variable represents so it is clear.

Inequalities and Number Lines

11. Consider the age of a voter. What are all possibilities for this person's age?

a. Write the possibilities in words and symbols. Then define and use a variable.

b. Draw a number line representing the ages.

We have three mathematical ways to write sets: a number line graph, an interval and set-builder notation.

12. Complete following table of examples. (Note that $x \geq 2$ can also be written as $2 \leq x$.)

Inequality	Number Line Graph	Interval	Set-Builder Notation
a. $x \geq 2$ Spend at least 2 dollars to use your coupon.			
b. $y > 2$ Spend more than 2 dollars to use a credit card.			
c. $s \leq 5$ You can spend at most 5 dollars			
d. $t < 5$ You need to complete a job in less than 5 hours			

More Practice

13. Consider the number of gallons of gas in a gas tank that has a maximum capacity of 12 gallons. What are all possibilities for the number of gallons of gas in this tank?

a. State this in words and symbols. Then define and use a variable.

b. Draw a number line representing the quantity.

14. Write an inequality for each situation using a variable and represent it using all three forms.

Inequality	Number Line Graph	Interval	Set-builder Notation
a. Kids must be over 4 feet tall to swim in the lake.			
b. A concert venue requires people to be _____ to attend.			$\{x \mid x \geq 21\}$
c. The submarine stayed below the surface of the water.			
d. The _____ altitude of the plane was 30,000 feet.		$[0, 30000]$	

15. Identify which sets each number belongs to.

a. $\sqrt{11}$

b. $\frac{1}{2}$

c. 3.5

d. -2

16. Give an example of each. If no such number exists, write none or does not exist (DNE).

a. Real, but not rational.

b. An integer, but not a whole number.

c. A natural number that is not rational.

17. Which set of numbers is best used when describing each scenario?

a. The number of gallons of gas remaining in a car.

b. The age of a person.

18. Write $<$, $>$, or $=$ to make a true statement.

a. $-7 \square -2$

b. $-\frac{1}{4} \square -0.25$

c. $\frac{2}{3} \cdot \frac{1}{2} \square \frac{1}{10}$

19. Write whether each comparison is true or false.

a. $\sqrt{2} \approx 1.414$

b. $-4 \geq -20$

c. $-0.5 \leq -0.4$