Math 60, Sections 1.5-1.7 Group Activity Name: Solutions

Section 1.5: Set Notation and Types of Numbers

Set Notation

1. Write the following in set notation.

a. Write the set of U.S. shoes sizes.

$\{1, 2, 3, \ldots 16\}$ half-sizes $\{1, 1.5, 2, 2.5, \ldots, 24\}$

b. Write the set of grades you could earn in a college class.

$\{A, B, C, D, F, P, NP, W, I\}$

Sets of Numbers

2. Write all of the sets that each number belongs to.

a. $-\frac{3}{5}$ rational, real

b. π irrational, real

c. $\sqrt{49} = 7$ counting/natural, whole, integer, rational, real

d. $1.\overline{852}$ rational, real

$1.852852852\ldots$

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

a. Rational, but not a whole number.

$3/5$, $-\frac{1}{2}$ any fraction or decimal repeating or terminating

b. A real number, but not an integer.

$-\frac{1}{2}$, 0.3, π, $\sqrt{2}$

c. An integer, but not a natural number.

$-2, -1, 0$

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

a. The number of pets in your household.

whole numbers

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

rational numbers

Section 1.6: Comparison Symbols

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

a. $1 \boxed{>} -2$

b. $-\frac{1}{3} \boxed{<} \frac{2}{5}$

c. $\frac{1}{3} \cdot \frac{1}{4} \boxed{<} \frac{1}{3} + \frac{1}{4}$ (×4, ×3)

$\frac{1}{12}$ $\quad \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$

d. $\frac{1}{3} \boxed{>} 0.3$

.3333... .3

e. $-|-7| \boxed{<} |-7|$

-7 $\quad 7$

f. $\frac{1}{4} \boxed{=} 0.25$

6. Write whether each comparison is true or false.

a. $-4.5 \neq -\frac{9}{2}$ $\quad -4\frac{1}{2}$

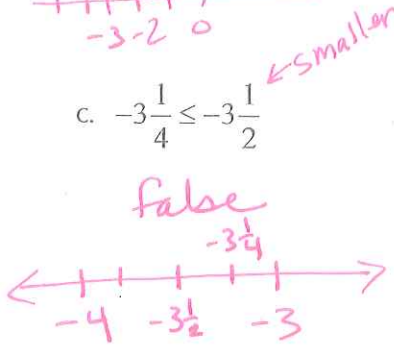
false

b. $-1 \leq 0$

true

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

false



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

$2.5, -\frac{3}{4}, \sqrt{16}, 0, -2$ $\quad (\sqrt{16} = 4)$

$4 > 2.5 > 0 > -\frac{3}{4} > -2$

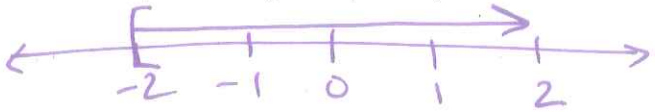
8. You buy a lottery ticket for $2. Consider your net winnings, including the cost of the ticket. What are all the possibilities for your net winnings?

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

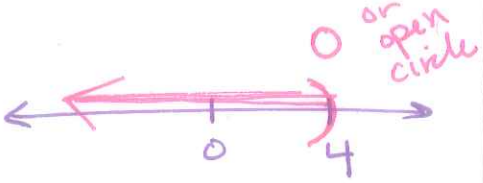
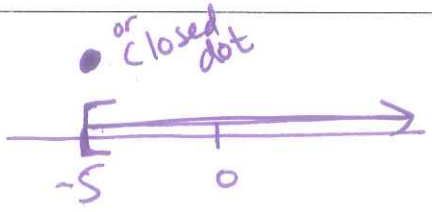
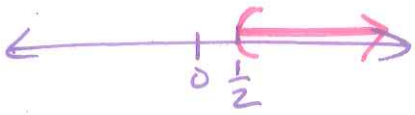
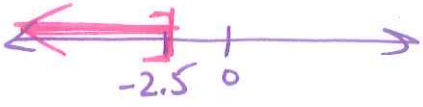
My net "winnings" could be -2 or higher

let x = net winnings

b. Draw a number line representing the quantity.

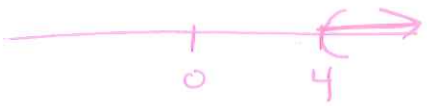
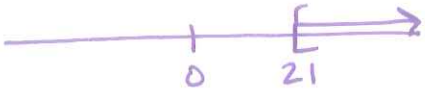
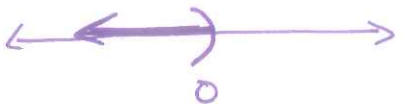
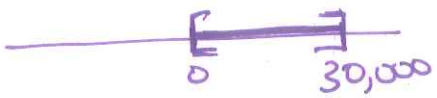


9. For each inequality, draw the number line graph and write the interval and set-builder notation.

Inequality	Number Line Graph	Interval	Set-Builder Notation
a. $t < 4$ ( )		$(-\infty, 4)$	$\{t \mid t<4\}$
b. $x \geq -5$ ↑ = [ ]		$[-5, \infty)$	$\{x \mid x \geq -5\}$
c. $r > \frac{1}{2}$		$(\frac{1}{2}, \infty)$	$\{r \mid r > \frac{1}{2}\}$
d. $y \leq -2.5$		$(-\infty, -2.5]$	$\{y \mid y \leq -2.5\}$

More Practice

10. Use the given information to write an inequality for each situation and fill in the missing information.

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

11. Identify which sets each number belongs to.

a. $\sqrt{11}$ irrational real

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

c. 3.5 rational real

d. -2 integer rational real

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

a. Real, but not rational. none

b. An integer, but not a whole number. -3

c. A natural number that is not rational. none

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

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

rational

b. The age of a person.

rational

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

a. $-7 \boxed{<} -2$

b. $-\frac{1}{4} \boxed{=} -0.25$

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

$\frac{1}{3} > \frac{1}{10}$

15. Write whether each comparison is true or false.

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

b. $-4 \geq -20$ true

c. $-0.5 \leq -0.4$ true