

Bounded Intervals

Let a and b be real numbers such that $a < b$. The following intervals on the real number line are **bounded intervals**. The numbers a and b are the **endpoints** of each interval.

<u>Interval Notation</u>	<u>Interval Type</u>	<u>Inequality</u>	<u>Graph</u>
$[a, b]$	Closed	$a \leq x \leq b$	
(a, b)	Open	$a < x < b$	
$[a, b)$	Half-open	$a \leq x < b$	
$(a, b]$	Half-open	$a < x \leq b$	

Unbounded Intervals

Let a and b be real numbers. The following intervals on the real number line are **unbounded intervals**.

<u>Interval Notation</u>	<u>Interval Type</u>	<u>Inequality</u>	<u>Graph</u>
$[a, \infty)$	Half-open	$x \geq a$	
(a, ∞)	Open	$x > a$	
$(-\infty, b]$	Half-open	$x \leq b$	
$(-\infty, b)$	Open	$x < b$	
$(-\infty, \infty)$	Entire Real Line	All real numbers	

For each of the following graph write the **interval type** and write the set in **inequality** and **interval notation**.

Graph

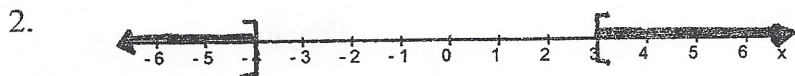
Interval Type

Inequality Notation

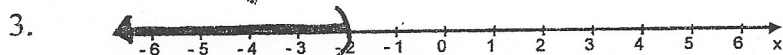
Interval Notation



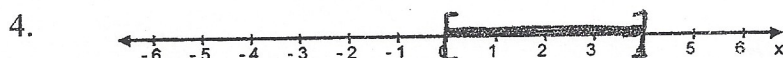
half open $-5 < x \leq 1$ $(-5, 1]$



half open $x \leq -4$ or $x \geq 3$ $(-\infty, -4] \cup [3, \infty)$



closed $x < -2$ $(-\infty, -2)$



closed $0 \leq x \leq 4$ $[0, 4]$



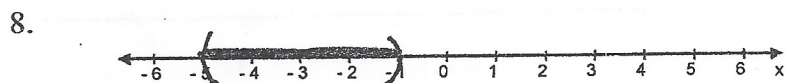
open $x < 2$ or $x > 3$ $(-\infty, 2) \cup (3, \infty)$



half open $x \geq -1$ $[-1, \infty)$



open $x < -3$ or $x > -3$ $(-\infty, -3) \cup (-3, \infty)$



open $-5 < x < -1$ $(-5, -1)$

For each of the following set written in inequality notation, write the **interval type**, draw the **graph** on a number line and write it in **interval notation**.

Inequality Notation

Interval Type

Graph

Interval Notation

9. $-5 < x < 2$

open



$(-5, 2)$

10. $0 \leq x < 4$

half open



$[0, 4)$

11. $x > 3$

open



$(3, \infty)$

12. $-1 \geq x \geq -2$

closed



$[-2, -1]$

$-2 \leq x \leq -1$

$-2 - 1$

<u>Inequality Notation</u>	<u>Interval Type</u>	<u>Graph</u>	<u>Interval Notation</u>
13. $x < -1$ or $x \geq 1$	<i>open</i>		$(-\infty, -1) \cup [1, \infty)$
14. $-4 \leq x < 5$	<i>half-open</i>		$[-4, 5)$
15. $x > 2$ or $x < 2$	<i>open</i>		$(-\infty, 2) \cup (2, \infty)$
16. $x \leq 0$	<i>half-open</i>		$(-\infty, 0]$

For each of the following sets written interval notation, write the **interval type**, write the set in **inequality notation** and draw the **graph** on a number line.

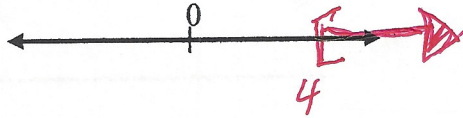
<u>Interval Notation</u>	<u>Interval Type</u>	<u>Inequality Notation</u>	<u>Graph</u>
17. $(3, 5]$	<i>half open</i>	$3 < x \leq 5$	
18. $(-\infty, -2]$	<i>half open</i>	$x \leq -2$	
19. $[-1, 5]$	<i>Closed</i>	$-1 \leq x \leq 5$	
20. $[0, \infty)$	<i>half open</i>	$x \geq 0$	
21. $(-\infty, -4] \cup (1, \infty)$	<i>open</i>	$x \leq -4$ or $x > 1$	
22. $(-3, 4)$	<i>open</i>	$-3 < x < 4$	
23. $(-\infty, 3) \cup (3, \infty)$	<i>open</i>	$x < 3$ or $x > 3$	
24. $(2, \infty)$	<i>open</i>	$x > 2$	

NAME: _____

Practice: Interval Notation

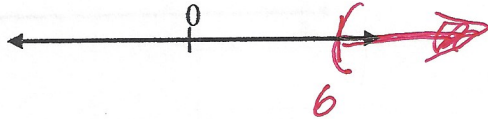
Put in interval notation AND draw a graph of each inequality.

1. $x \geq 4$



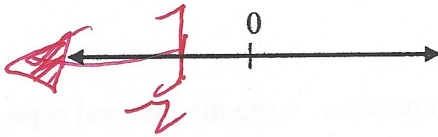
1. $[4, \infty)$

2. $x < 6$



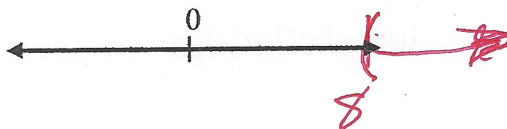
2. $(6, \infty)$

3. $x \leq -2$



3. $(-\infty, -2]$

4. $x > 8$



4. $(8, \infty)$

5. $x < -10$



5. $(-\infty, -10)$

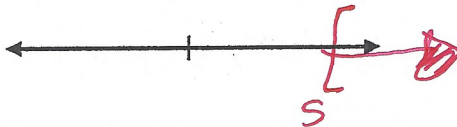
Write each interval as an inequality, and draw a graph for each.

6. $(-\infty, -8]$



6. $x \leq -8$

7. $[5, \infty)$



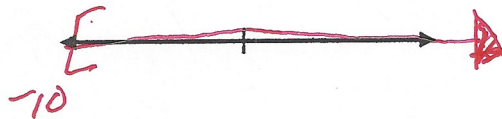
7. $x \geq 5$

8. $(-2, \infty)$



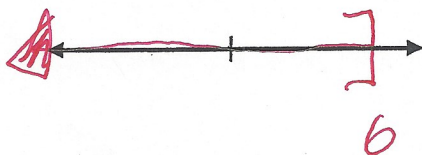
8. $x > -2$

9. $[-10, \infty)$



9. $x \geq -10$

10. $(-\infty, 6)$



10. $x \leq 6$