

BE-1A TUESDAY 4-22-08

Name THE SET of numbers:

① $\{1, 2, 3, \dots\}$

② $\{0, 1, 2, 3, \dots\}$

③ $\{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$

④ $\{\text{terminating or repeating decimals}\}$

⑤ $\{\text{non-terminating and non-repeating decimals}\}$

⑥ $\{\text{sets ④ and ⑤}\}$

⑦ Define a relation.

⑧ Define a function

• Homework review: Pg 330 # 39-42.

There ARE many cases in which you need to use more than one inequality to model a situation.

For example, you might be looking for a used car that is $> \$500$ and $< \$3000$.

Ex) Your allowable speed on a highway might be $> 45 \text{ mph}$ and $< 65 \text{ mph}$.

Ex) Your allowable height (assuming you are a pilot) to avoid bad weather is:

$< 20,000 \text{ ft}$ or $> 30,000 \text{ ft}$.

These are all examples of:

Compound Inequalities



MORE THAN ONE

The "and" and "or" make a big difference as we will see shortly.

Ch 6-4 "Solving Compound Inequalities"

In this chapter, we will only look at
Compound Inequalities with 2 inequalities.

An AND Compound Inequality is true iff
Both inequalities are true.

↓
MEANS IF AND
ONLY IF

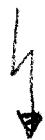
An OR Compound Inequality is true iff
ONE or both inequalities are true.

Both types of Compound Inequalities can be
written using the words "and", "or."

An "AND" has another shorthand method to
write it.

Other name:

"AND"



intersection

"OR"



union

LET'S LOOK AT AN "AND" Compound inequality

EX1
PS 339

$$x < 3 \text{ AND } x \geq -2$$



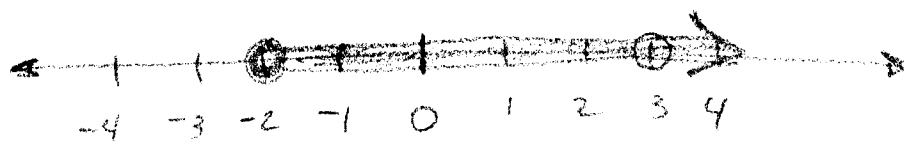
EX Change EX1 to AN "OR" Compound inequality

$$x > 3 \text{ OR } x \leq -2$$

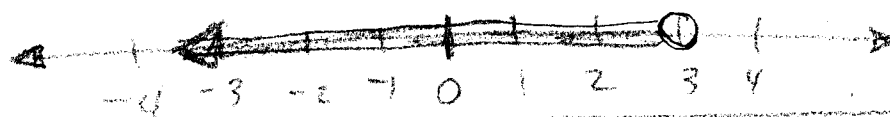


EX Other possible, but less common "OR"

$$x > 3 \text{ OR } x \geq -2$$



$$x < 3 \text{ OR } x \leq -2$$



WHY DOES $x < 3 \text{ OR } x \geq -2$ MAKE NO SENSE?

4

There is a SHORTHAND WAY OF
WRITING "AND" COMPOUND INEQUALITIES
(WITH OR COMPOUND INEQUALITIES YOU HAVE
TO WRITE OUT THE WORD "OR")

SHORTHAND WAY FOR "AND"

EX) $x < 3$ AND $x \geq -2$

$-2 \leq x < 3$
OR $3 > x \geq -2$

BOTH INEQUALITY
SYMBOLS MUST
POINT THE
SAME WAY

EX) WRITE $x < 4$ AND $x \geq 1$ THE SHORT WAY

$1 \leq x < 4$ OR $4 > x \geq 1$

EX) WRITE $x > 0$ AND $x < 6$ SHORTWAY

$0 < x < 6$ OR $6 > x > 0$

EX) WRITE $-2 < x < 3$ THE LONG WAY

$x > -2$ AND $x < 3$

Solving Compound Inequalities

-💡 Divide into 2 parts

(Ex 2)
Pg 340

$$-5 < x - 4 < 2$$

means
 $-5 < x - 4$ AND
 $x - 4 < 2$

$$\begin{array}{r} -5 < x - 4 \\ +4 \quad +4 \end{array}$$

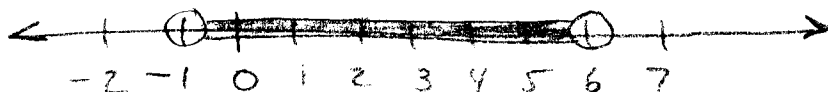
$$-1 < x$$

$$x > -1$$

$$\begin{array}{r} x - 4 < 2 \\ +4 \quad +4 \end{array}$$

AND

$$x < 6$$



(Ex)

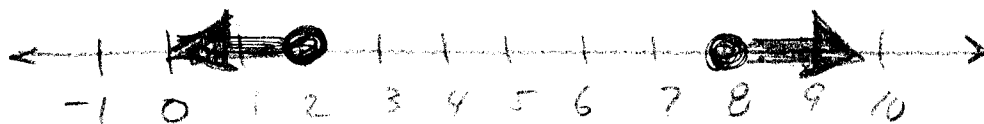
$$n - 7 \leq -5 \quad \text{OR} \quad n - 7 \geq 1$$

$$\begin{array}{r} +7 \quad +7 \quad \quad \quad +7 \quad +7 \end{array}$$

$$n \leq 2$$

OR

$$n \geq 8$$



Homework: • Read Ch 6-4

• Pg 341 # 4, 5, 8, 10, 11.