

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

বিস্মিল্লাহির রাহমানির রাহীম



একাডেমিক এন্ড এডমিশন কেয়ার



INEQUALITY

Chapter 6.1

INEQUALITY

- NOT EQUAL
- GREATER OF SMALLER
- MORE OR LESS

WHY?

In real life, inequality is vastly used than equality

Example - 1

- Speed will not exceed 40



Example - 2



- Upto 150 taka



Example - 3

Grading Scale

A	93-100
A-	90-92
B+	87-89
B	83-86
B-	80-82
C+	77-79
C	73-76
C-	70-72
D+	67-69
D	63-66
D-	60-62
F	59



Symbol

- 3 and 5 are not equal

- $3 \neq 5$

- 5 is greater than 3

- $5 > 3$

- 3 is less than 5

- $3 < 5$

- $x \geq 5$

- x can be greater than 5 or equal to 5

- not less than 5

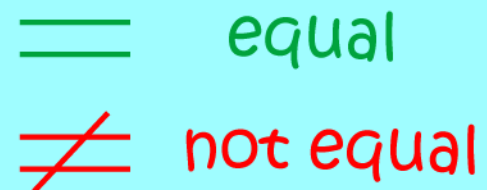
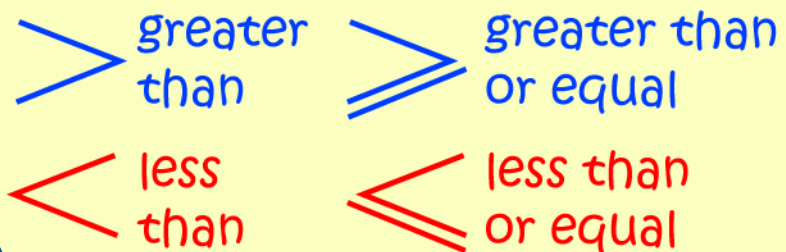
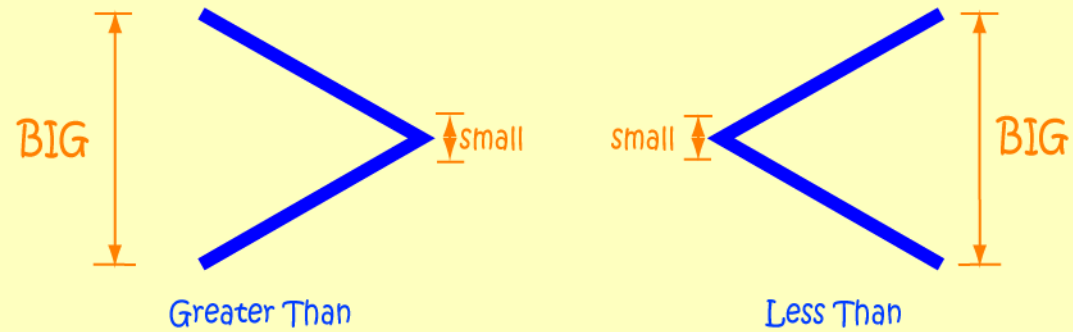
- $x \leq 5$

- x can be less than 5 or equal to 5

- not greater than 5

SYMBOL

Equality and Inequality



POLL QUESTION - I

■ $x \geq y$, Which one is larger?

■ x

■ y

x, y not sure

$>$

$x > y \rightarrow$

$x = y$

Thinking outside the
box

Number Line

Inequalities on a number line

An **open circle** means that the value is **not included**:

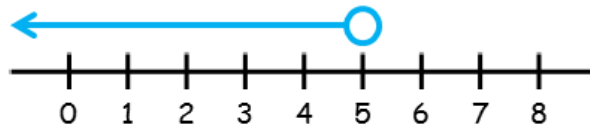
$$x > 2$$

x is greater than 2



$$x < 5$$

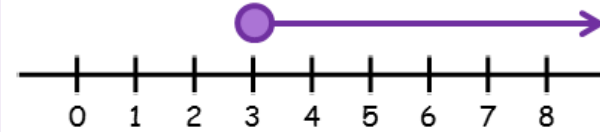
x is less than 5



A **filled in circle** means that the value is **included**:

$$x \geq 3$$

x is greater than or equal to 3



$$x \leq 6$$

x is less than or equal to 6



If x is **between** two values, use **two circles**:



$$1 < x \leq 6$$

x is greater than 1, but less than or equal to 6.

POLL QUESTION - 2

- In which side of -20 we can find -40 ?
 - Left Side
 - Right Side

Rules

- $x = y$
- $x + \underline{20} = y + \underline{20}$
- $x - 20 = y - 20$
- $x \cdot 20 = y \cdot 20$
- $\frac{x}{20} = \frac{y}{20}$

$$\underline{30} > 20$$

$$30 + 10 > 20 + 10$$

$$40 > 30$$

$$30 > 20$$

$$30 \times 2 > 20 \times 2$$

$$60 > 40$$

$$30 > 20$$

$$30 - 10 > 20 - 10$$

$$20 > 10$$

$$30 > 20$$

$$\frac{30}{2} > \frac{20}{2}$$

$$15 > 10$$

Rules

- $x = y$
- $x + 20 = y + 20$
- $x - 20 = y - 20$
- $x \cdot 20 = y \cdot 20$
- $\frac{x}{20} = \frac{y}{20}$

$$\underline{30} > 20$$

$$30 + (-10) > 20 + (-10)$$

$$\underline{20} > 10$$

$$\underline{30} > 20$$

$$30 \times (-2) < 20 \times (-2)$$

$$\underline{-60} < -40$$

$$\underline{30} > 20$$

$$30 - (-10) > 20 - (-10)$$

$$\underline{40} > 30$$

$$\underline{30} > 20$$

$$\frac{30}{-2} < \frac{20}{-2}$$

$$-15 < \underline{-10}$$

Rules

- $x = y$
- $x + 20 = y + 20$
- $x - 20 = y - 20$
- $x \cdot 20 = y \cdot 20$
- $\frac{x}{20} = \frac{y}{20}$

$\times \div \rightarrow \text{Negative}$

$> \rightarrow <$

$< \rightarrow >$

$\geq \rightarrow \leq$

$\leq \rightarrow \geq$

Rules

- $x = y$
- $x + 20 = y + 20$
- $x - 20 = y - 20$
- $x \cdot 20 = y \cdot 20$
- $\frac{x}{20} = \frac{y}{20}$

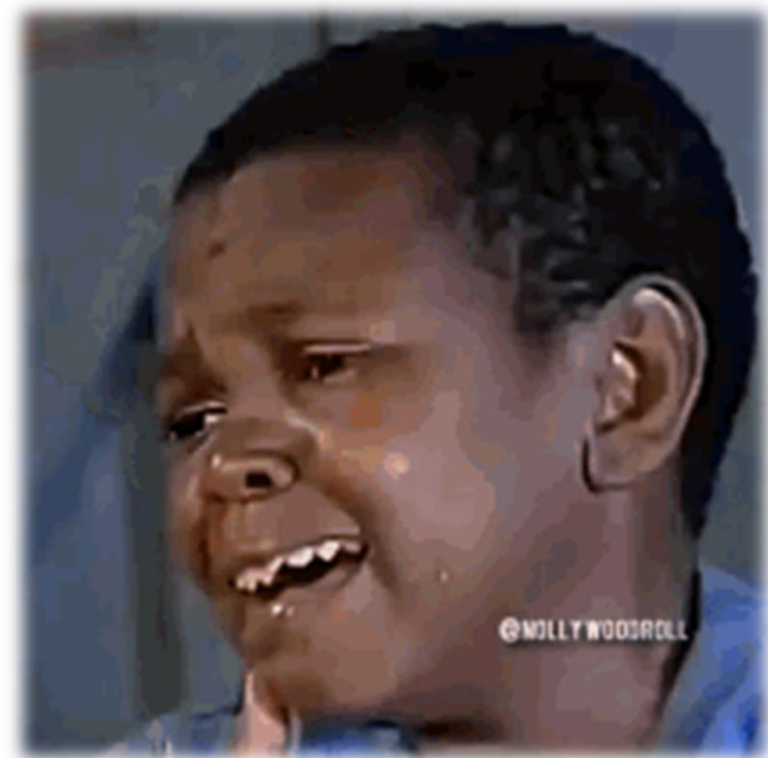
- $x > y$
- $x + 20 > y + 20$
- $x - 20 > y - 20$
- $x \cdot 20 > y \cdot 20$
- $\frac{x}{20} > \frac{y}{20}$

- $x > y$
- $x + (-20) > y + (-20)$
- $x - (-20) > y - (-20)$
- $x \cdot (-20) < y \cdot (-20)$
- $\frac{x}{-20} < \frac{y}{-20}$

NOW SOME MATHS!!!



GOLAM RABBANI GALIB



23-Jun-20

18

$$y - 3 < 5$$

$$y - 3 < 5$$

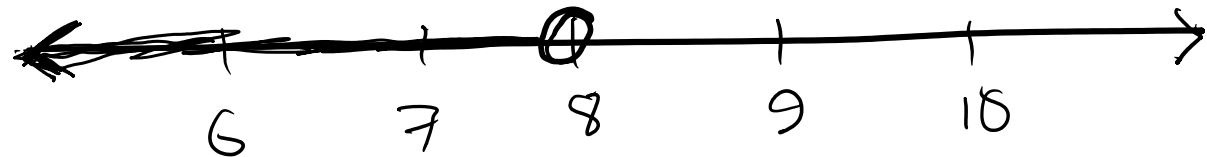
$$\text{or, } y - 3 + 3 < 5 + 3$$

$$\therefore \underline{\underline{y < 8}}$$

$$\underline{\underline{y \leq 8}} \rightarrow \text{filled}$$

$$y < 8 \rightarrow \text{open}$$

$$y - 3 = 5$$



$$3(x - 2) < 6$$

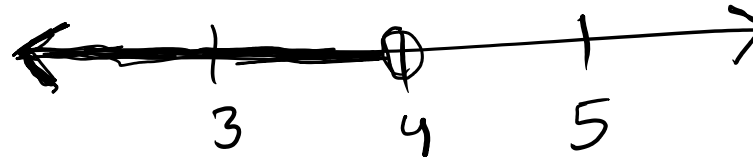
$$3(x - 2) < 6$$

$$\text{or, } \frac{3(x - 2)}{3} < \frac{6}{3}$$

$$\text{or, } x - 2 < 2$$

$$\text{or, } x - 2 + 2 < 2 + 2$$

$$\therefore \underline{x < 4}$$



Less - Left
↑ ↑

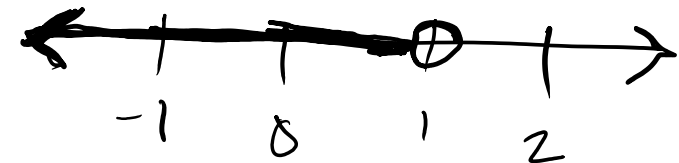
$$\underline{\underline{\text{Set} = \{x : x < 4\}}}$$

$$3x - 2 < 2x - 1$$

$$3x - 2 < 2x - 1$$

$$\text{or, } 3x - \cancel{2} + \cancel{2} - 2x < \cancel{2x} - 1 + 2 - \cancel{2x}$$

$$\therefore \underline{\underline{x < 1}}$$



$$z \leq \frac{1}{2}z + 3$$

$$z \leq \frac{1}{2}z + 3$$

$$\text{or, } z - \frac{1}{2}z \leq 3$$

$$\text{or, } \frac{2z - z}{2} \leq 3$$

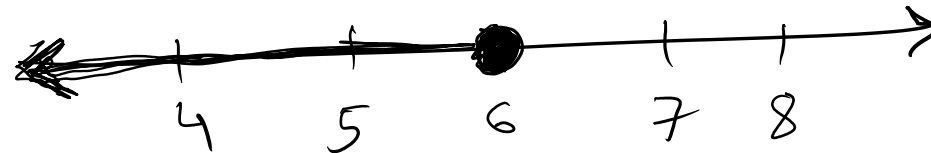
$$\text{or, } \frac{z}{2} \leq 3$$

$$\text{or, } z \leq 3 \times 2$$

$$\therefore z \leq 6$$

$$y - 3 = 5$$

$$\text{or, } y = 5 + 3$$



POLL QUESTION - 3

- $8 \geq 2 - 2x$, what can be the value of x ?
 - -10
 - -4
 - -3
 - -12

$$8 \geq 2 - 2x$$

$$\text{or, } 2x \geq 2 - 8$$

$$\text{or, } 2x \geq -6$$

$$\therefore x \geq -3$$

POLL QUESTION - 4

• $x \leq \frac{x}{3} + 4$, what can be the value of x ?

• 10 ✗

• 4 ✓ → Ans.

• 30 ✗

• 12 ✗

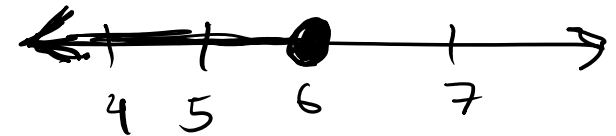
$$x \leq \frac{x}{3} + 4$$

$$\text{or, } 3x \leq x + 12$$

$$\text{or, } 3x - x \leq 12$$

$$\text{or, } 2x \leq 12$$

$$\therefore x \leq 6$$



$$5(3 - 2t) \leq 3(4 - 3t)$$

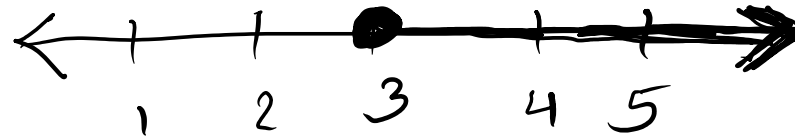
$$5(3 - 2t) \leq 3(4 - 3t)$$

$$\text{or, } 15 - 10t \leq 12 - 9t$$

$$\text{or, } -10t + 9t \leq 12 - 15$$

$$\text{or, } -t \leq -3$$

$$\text{or, } t \geq 3$$



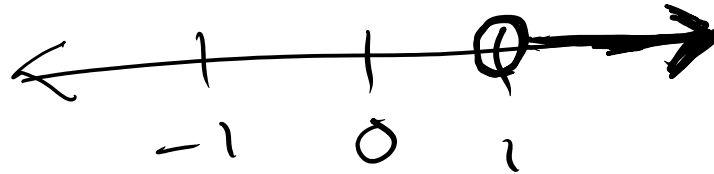
$$\frac{x}{3} + \frac{x}{4} + \frac{x}{5} > \frac{47}{60}$$

$$\frac{x}{3} + \frac{x}{4} + \frac{x}{5} > \frac{47}{60}$$

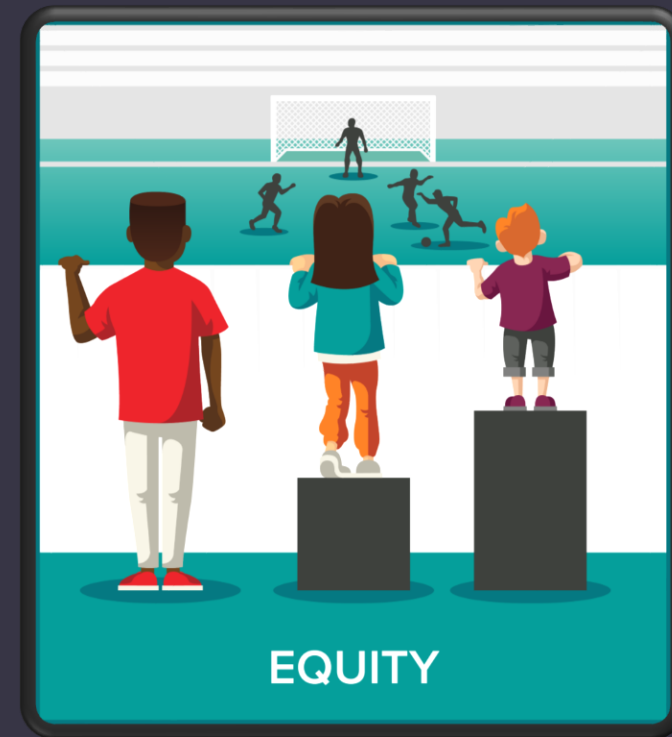
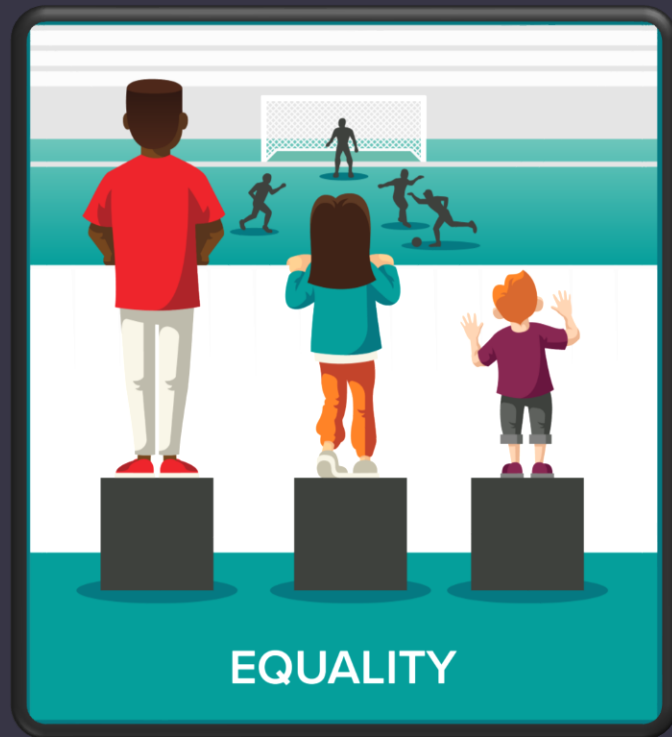
$$\therefore x > 1$$

$$\text{or, } \frac{20x + 15x + 12x}{60} > \frac{47}{60}$$

$$\text{or, } \frac{47x}{60} > \frac{47}{60}$$



Class Over!



লেগে থাকো সৎভাবে,
স্বপ্ন জয় তোমারই হবে

ঊদ্ভাস-উন্মেষ শিক্ষা পরিবার

Thank You