

a.

Expression: $a = 10$ or $b = 20$

let say

$a = 10$ and $b =$ anything except NULL, which mean that expression becomes True

$b = 20$ and $a =$ anything except NULL, expression evaluates to True

$b =$ is not 20 and $a =$ is not 10, so expression evaluates to False

But it changes if a or b are NULL values

Null value is evaluated as Null; Null is an absence of any value which mean it gives itself or nothing

a or $b =$ null and a or b any number, then the expression evaluates to Null

$a =$ null and $b =$ null, evaluates to null.

So, comparing anything to null is always null not true or false.

b.

Expression: $a = 10$ or $b = 20$

let say

$a = 10$ and $b =$ anything except NULL, which mean that expression becomes False

$b = 20$ and $a =$ anything except NULL, expression evaluates to False

$b =$ is not 20 and $a =$ is not 10, so expression evaluates to False

let say $a = 10$ and $b = 20$, which is the only scenario the expression evaluates to True.

But it changes also if a or b are NULL values

a or $b =$ null and a or b any number, then the expression evaluates to Null

$a =$ null and $b =$ null, evaluates to null.

So, comparing anything to null is always null not true or false.

c.

Let a and b be numbers which mean

The expression $(a < 10$ or $a \geq 10)$ evaluates like any conditional statement with numbers

But if a or b is null value or both null values then the answer will be null for any expression.

In the slides, it says (unknown and some value) evaluates to unknown or

Unknown = unknown \rightarrow unknown

Null means Unknown literally because null is nothing! So it evaluates as unknown!

Null or $a \geq 10$ gives null

Or any statement where a or b is null gives null! In the scenario where one of the value is null.