Class Activity 1.4: Relational and Logical Expressions

In this activity, we will review relational and logical expressions that are the basis of conditional expressions.

Please fill in the roles for each member of your team. Take a look at the description of each role to see its responsibilities. In case there are only three people in the group, please assign the same person to the **Presenter** and **Reflector** role. It is a good idea to select roles that you have not recently taken.

Team name: _____ Date: _____

Role	Team Member Name
Manager. Makes sure team starts quickly and remain focused during the activity; takes care of time management; makes sure all voices in the team are heard	
Presenter. The only person in the team assigned to communicate questions and clarifications with the instructor or other teams; ensures all team members have had a chance to respond before asking outside sources; ensures that everyone in the team agrees on what to ask if an outside source is needed; presents conclusions of the team to the class, as requested.	
Reflector. Guides consensus-building process so that the team agrees on responses to questions; observes team dynamics and behavior with respect to the learning process; reports to the team periodically during the activity on how the team performs; possibly report to the entire class about how well the team is operating.	
Recorder. Records the names and roles of the group members at the beginning of each activity; records the important aspects of group discussions, observations, insights, etc.; the recorder's report is a log of the important concepts that the group has learned.	

1. Evaluate the following relational operators and identify their output. Assume that $x = 10$.

Expression	Output
`12 > 5`	`true`
`7 <= 5`	`false`
`X == 10`	`true`
`X <= 8`	`false`
`X != 8`	`true`
`X == 8`	`false`

2. Complete the truth tables below

&& operator

	T	**F**
T	T	F
F	F	F

|| operator

	T	**F**
T	T	T
F	T	F

! operator

!T	F
!F	T

Use the table below to answer the following questions.

Age bracket	Age range
Child	12 years old and below
Teen	13 - 19 years old (inclusive)
Adult	20 - 59 years old (inclusive)
Senior	60 years old and over

3. Assume that a person's age is stored in a variable called *age*. Construct a relational expression in C++ that returns *true* if the age of the person is that of a child.

```
Answer: age <= 12
```

4. Assume that a person's age is stored in a variable called *age*. Construct a relational expression in C++ that returns *true* if the age of the person is that of a teen.

```
Answer: age >= 13 && age <= 19
```

5. Assume that a person's age is stored in a variable called *age*. Construct a relational expression in C++ that returns *true* if the age of the person is 3, 5, 9, or 13.

```
Answer: age == 3 || age == 5 || age == 9 || age == 13
```

6. Assume that a person's age is stored in a variable called *age*. Construct a relational expression in C++ that returns *true* if the age of the person is that of a child or adult.

```
Answer: age <= 12 || age >= 20 && age <= 59
```

7. What are the results of the following expressions?

Expression	Output
`8 < 2 + 7 || 5 == 6`	`true`
`12 * 3 + 5 / 2`	`38`
`5 == 8 && 4 + 6 / 2 * 3 < 15 && 2 + 2 == 2 * 2`	`false`