

Name (last, first): _____

1.2 Applications of Propositional Logic

Software Application Development: Decision Structures (Conditional/Branching Statements)

Given the following **boolean** values for x, y, z:

boolean x = true;
boolean y = false;
boolean z = true;

evaluate the following logical expressions.

Label the result true or false.

(x && y) _____

(x || y) _____

(! x) _____

((x && y) || (x && z)) _____

((x || ! y) && (!x || z)) _____

(x && (y && z)) _____

(x && (y || z)) _____

(! (x || y) && z) _____

Java: notes on data types (storage space for data)

boolean: data type stores the logic values of true and false

int: data type that stores integer values - a number with no fractional part

Java syntax:

&&:	\wedge	“and”
:	\vee	“or”
!:	\neg	“not”

Given the following **integer** values:

int a = 1, b = 2, c = 3, d = 3, e = -17, f = 27;

evaluate the following logical expressions.

Label the result true or false.

((a < b) && (c < d)) _____

((e > d) || (c == d)) _____

((f / 9 == c) && (c <= d)) _____

(!(c < d) && (a < b)) _____

(a <= b) && (c > d) || (e < -16) && ((e + c * b) > (f * -1)) _____

Java syntax:

<:	“less than”
>:	“more than”
==:	“equal to”
<=:	“less than or equal to”
>=:	“more than or equal to”

Important!

inclusive: includes start and end value (start <= x <= end)

exclusive: does not contain start and end value (start < x < end)

For System Protocol Consistency:

p	The diagnostic message is stored in the buffer.
q	The diagnostic message is retransmitted.

Consistency Statements:

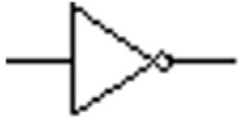
	The diagnostic message is stored in the buffer or it is retransmitted.
	The diagnostic message is not stored in the buffer.
	If the diagnostic message is stored in the buffer, then it is retransmitted.

S1	S2	CS1	CS2	CS3
p	q			

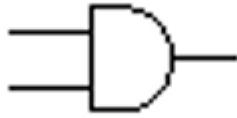
	The diagnostic message is not retransmitted.
--	---

S1	S2	CS1	CS2	CS3	CS4
p	q				

Logic Circuits for computer hardware design:



Inverter



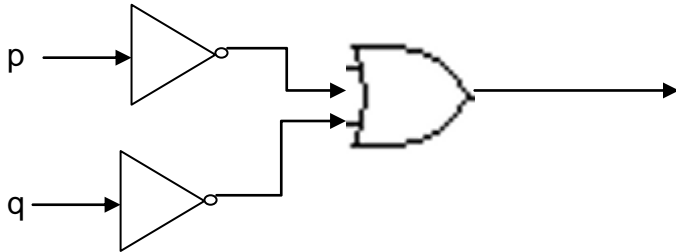
AND gate



OR gate

P. 24 # 40 (a-b)

a.



b.

P. 24 # 41 (a-b)

P. 24 # 42

$$(p \wedge \neg r) \vee (\neg q \wedge r)$$

P. 24 # 43