1. Arithmetic expressions

The #include #include will fail because it's a predefined macro and expects a filename as an argument. The other one that has a possibility of failure is x = 3.1. If we declare x a float it fails, but if we declare it a double it passes. I was unsure of this one so I had to check it. After checking I've concluded that floats because they are typically represented as a decimal number followed by f, to represent a float, are not the same as a decimal number without the f. So, 3.1 is not a float which means 3.1 does not equal 3.1f. At least not to the computer. 3 is equal to 3.0 as it is interpreted as an int and double. 3.1 is equal to 3.1 because both are double and true evaluates to 1 in C++ which is an int and as before is the same as the double 1.0. C++ char evaluate to both int and an ascii character so in the case of 'a' equals 97 'a' will cast as an int of 97 so 97 equals 97. NULL is another C++ predefined macro that evaluates to 0 and pointers set to address 0 are interpreted as being essentially null because it is an operating system reserved address. As such NULL equals p which equals 0.

2. Truth Table for cast operators

int	char	float	bool	int+char	int+float	int+bool	char+float	char+bool	float+bool
0	0	0	1	0	0	0	0	0	0
0	0	1	0	0	1	0	1	0	1
0	1	0	0	0	0	0	0	1	0
0	1	1	0	0	1	0	1	1	1
0	1	0	1	0	0	0	0	1	0
0	1	1	1	0	1	0	1	1	1
0	0	1	1	0	1	0	1	0	1
0	0	0	0	0	0	0	0	0	0
1	0	0	0	1	0	1	0	0	0
1	1	0	0	1	0	1	0	1	0
1	0	1	0	1	1	1	1	0	1
1	0	0	1	1	0	1	0	0	0
1	0	1	1	1	1	1	1	0	1
1	1	1	0	1	1	1	1	1	1
1	1	0	1	1	0	1	0	1	0
1	1	1	1	1	1	1	1	1	1

3. Operators

Binary: &, |, ^, ~, <<, >>
Unary: +, -, !, ~, ++, –, (type)*, &, sizeof
Ternary: ?, :

4. Increment Operators

If we removed the #include macro it would run. The macro expects a filename and has issue when none is provided.

When y is initialized to x+++2 this is what happens. The value of x is pulled from memory then 2 is added to it and their combined sum are stored in y. Then x is incremented by one and stored back in storage with y = 6 and x = 5.

5. More Truth Tables

AND Table

X	Y	AND
0	0	0
0	1	0
1	0	0
1	1	1

OR Table

X	Y	OR
0	0	0
0	1	1
1	0	1
1	1	1

NOT Table

X	NOT
0	1
1	0