1a. Find the sum-of-products term for each row of the odd parity function:

x	y	z	ODD(x,y,z)	SOP term
0	0	0	0	
0	0	1	**1**	
0	1	0	**1**	
0	1	1	0	
1	0	0	**1**	
1	0	1	0	
1	1	0	0	
1	1	1	**1**	

1b. Write the complete sum-of-products expression:

1c. Draw the circuit for ODD(x, y, z) (or draw in Logisim):

2a. Find the SOP terms for a function that is true when the absolute value of a 3-bit two's complement number is >= 2

x	y	z	decimal	ABS(x, y, z)	SOP term
0	0	0			
0	0	1			
0	1	0			
0	1	1			
1	0	0			
1	0	1			
1	1	0			
1	1	1			

2b. Write the complete sum-of-products expression for ABS(x, y, z):

2c. Minimize the expression for ABS(x, y, z):

2d. Draw the circuit for ABS(x, y, z) (or draw in Logisim):

3a. Show that {NAND} is universal (show that you can create AND, OR, and NOT gates using only NAND gates):

3b. Show that {NOR} is universal (show that you can create AND, OR, and NOT gates using only NOR gates):

3c. Show that {AND, NOT} are universal (hint use SOP and De Morgan's):

3d. Show that {OR, NOT} are universal (hint use POS and De Morgan's):