

1. $375.54_8 = 3 \times 64 + 7 \times 8 + 5 + 5/8 + 4/64$
 $= 253.6875_{10}$

3	253		0.69
3	84	r1	3
3	28	r0	(2).07
3	9	r1	3
3	3	r0	(0).21
3	1	r0	3
0		r1	(0).63
			3
			(1).89

$\therefore 375.54_8 = 100101.2001_3$

2.

	6 3 1 1		6 3 1 1
0	0 0 0 0		0 0 0 0
1	0 0 0 1		1 0 0 1 0
2	0 0 1 1		2 0 0 1 1
3	0 1 0 0		3 0 1 0 0
4	0 1 0 1		4 0 1 1 0
5	0 1 1 1	or	5 0 1 1 1
6	1 0 0 0		6 1 0 0 0
7	1 0 0 1		7 1 0 1 0
8	1 0 1 1		8 1 0 1 1
9	1 1 0 0		9 1 1 0 0

$$9253 = 1100\ 0011\ 0111\ 0100$$

3. $G = [(AB)'(B + C)]'C = (AB + B'C')C = ABC$

4. $A'C'D' + ABD' + A'CD + B'D$

$$= D'(A'C' + AB) + D(A'C + B')$$

$$= D'[(A' + B)(A + C')] + D[(B' + A')(B' + C)] \quad \{\text{Using } XY + X'Z = (X' + Y)(X + Z) \text{ twice inside the brackets}\}$$

$$= [D + (A' + B)(A + C)][D' + (B' + A')(B' + C)] \quad \{\text{Using } XY + X'Z = (X' + Y)(X + Z) \text{ with } X = D\}$$

$$= (D + A' + B)(D + A + C')(D' + B' + A')(D' + B' + C) \quad \{\text{Using the Distributive Law}\}$$

5.

(a)

	AB	00	01	11	10
CD	00		X	1	X
	01	1	X		1
	11	1	X	1	1
	10		X	1	

(b)

	AB	00	01	11	10
CD	00	0	X		X
	01		X	0	
	11		X		
	10	0	X		0

$$f' = BC'D + B'D'$$

$$\Rightarrow f = (B' + (C+D))(B+D)$$

6.

a

1/0

	de	bc	00	01	11	10
	00	0	1	0	1	1
	01	0	0	1	0	0
	11	0	1	0	1	0
	10	0	0	1	1	1

$$f = a'd'e' + a'ce' + abc + ace + bde' + a'bc'd$$