

1. $(101110)_2 = 32 + 8 + 4 + 2 = 46$
 $(1110101)_2 = 64 + 32 + 16 + 4 + 1 = 117$
 $(110110100)_2 = 256 + 128 + 32 + 16 + 4 = 436$

2. $(7562)_{10} = (16612)_8$
 $(1938)_{10} = (792)_{16}$
 $(175)_{10} = (10101111)_2$

3. $(215)_{10} = 128 + 64 + 16 + 7 = (11010111)_2$
 (a) 000011010111 Binary
 (b) ~~000~~011 010 111 Binary coded octal
 0 3 2 7
 (c) 0000 1101 0111 Binary coded hexadecimal
 0 D 7
 (d) 0010 0001 0101 Binary coded decimal
 2 1 5

4.

A	B	C	A·B·C	(A·B·C)'	A'	B'	C'	A'+B'+C'
0	0	0	0	1	1	1	1	1
0	0	1	0	1	1	1	0	1
0	1	0	0	1	1	0	1	1
0	1	1	0	1	1	0	0	1
1	0	0	0	1	0	1	1	1
1	0	1	0	1	0	1	0	1
1	1	0	0	1	0	0	1	1
1	1	1	1	0	0	0	0	0

5. (a) $AB + A(CD + CD') = AB + AC(D + D') = A(B + C)$
 (b) $(BC' + A'D)(AB' + CD') =$
 $= \underbrace{ABBC'}_0 + \underbrace{A'AB'D}_0 + \underbrace{BCC'D'}_0 + \underbrace{ACD'D}_0 = 0$

6. $F = x'y + xy'z'$
 (a) $F' = (x+y')(x'+y'+z) = x'y' + xy' + y' + xz + y'z$
 $= y'(1+x'+x+z) + xz = y' + xz$
 (b) $F \cdot F' = (x'y + xy'z')(y' + xz) = 0 + 0 + 0 + 0 = 0$
 (c) $F + F' = x'y + xy'z' + y' + xz(y + y')$
 $= x'y + xy(z' + z) + y'(1 + xz) = x'y + xy + y'$
 $= y(x' + x) + y' = y + y' = 1$