ICS #5

5.1

a) $\sum_{r=1}^{n} b^{r-1}$

b) $\frac{1-b^n}{1-b} = \sum_{r=1}^{n} b^{r-1}$

$n=1$,

L.H.S

$\frac{1-b}{1-b} = 1$

R.H.S

$\sum_{r=1}^{1} b^{r-1} = b^{1-1} = b^0 = 1$

L.H.S = R.H.S for $n=1$

$n=k$

$\frac{1-b^k}{1-b} = \sum_{r=1}^{k} b^{r-1}$

$n=k+1$

$\sum_{r=1}^{k+1} b^{r-1} = \sum_{r=1}^{k} b^{r-1} + b^{(k+1)-1}$

$$\frac{1-b^k}{1-b} + b^k \times \frac{(1-b)}{1-b}$$

$$= \frac{1-b^k + b^k - b^{k+1}}{1-b}$$

$$= \boxed{\frac{1-b^{k+1}}{1-b}}$$

5.2 8 4 2 1

	Hex	Binary	Dec	
a)	48	= 0100 1000	= 72	1
	65	= 0110 0101	= 101	2
	6c	= 0110 1100	= 108	3
	6c	= 0110 1100	= 108	4
	6f	= 0110 1111	= 111	5
	20	= 0010 0000	= 32	6
	f0	= 1111 0000	= 240	7
	9f	= 1001 1111	= 159	8
	8c	= 1000 1100	= 140	9
	8d	= 1000 1101	= 141	10 A
	21	= 0010 0001	= 33	11 B
	0a	= 0000 1010	= 10	12 C
				13 D
				14 E
b)	48, 65, 6c, 6c, 6f, 20, f0, 9f, 8c, 8d			15 F

21, 0a.

Decimal

72 101 108 108 111 32 240 159 140 141 33 10

ASCII H e l l o sp ≡ f î ì ! nL

Hello 🌍!

← newline.

c) Single character is used for newline

dec	Hex	name	description
10	0A	LF	new line.

line end conventions.

- '\n' escape character
- '\r' return in Mac OS (carriage Return)
- '\r\n' End of line sequence