8th Grade Assignment – Week #3

Individual Work:

- **Number Bases - Practice Sheet #3**: Do only Problem #4 (the right column).
- **Number Bases - Practice Sheet #4**: Get as far as you can. The following (optional) problems are more challenging: #1(c,e,h), #3c, #4c

Group Assignment for Tuesday and Thursday

- Make sure you have accurately completed the **Place Value Table** found at the bottom of **Group Sheet #3**. (I quickly did this table in the lecture.)
- See how far you get with **Number Bases - Group Sheet #4**.

Number Bases – Group Sheet #3

1) Convert from octal to decimal.

   a) 246_{oct}

   b) 777_{oct}

   c) 1000_{oct}

2) Convert from decimal to octal.

   a) 87_{dec}

   b) 384_{dec}

3) Octal arithmetic!

   a) 456_{oct}
     $+372_{oct}$

   b) 333333_{oct}
     -55555_{oct}

   c) 46_{oct}
     $\times 57_{oct}$

Base-five

4) What are the digits in the base-five system?

5) Count in base-five until you are ten past the point of needing three digits.

6) What are the first four place values of the base-five system? (Write them in decimal.)

7) Convert to decimal.

   a) 23_{five}

   b) 42_{five}

   c) 103_{five}

   d) 433_{five}

8) Convert to base-five.

   a) 6_{dec}

   b) 16_{dec}

   c) 58_{dec}

Hexadecimal (Base-16)

9) What are the digits in the hexadecimal system?

10) Count in hex up to 30_{hex}.

11) Write down the three numbers that follow each hexadecimal number.

   a) 18_{hex}

   b) $3E_{hex}$

   c) $4A8_{hex}$

   d) $29E_{hex}$

   e) $6FE_{hex}$

12) What are the first four place values of the hexadecimal system? (Write them in decimal.)

13) Convert to decimal.

   a) 23_{hex}

   b) $A2_{hex}$

   c) $13B_{hex}$

14) Convert to hex.

   a) 6_{dec}

   b) 28_{dec}

   c) 268_{dec}

15) Fill in the table.

Place Value (Exponent)

10	9	8	7	6	5	4	3	2	1	0	BASE
											2
											5
											8
					100000	10000	1000	100	10	1	10
											16

Number Bases − **Practice Sheet #3**

1) Convert from octal to decimal. (If you get stuck, then try writing it in expanded notation first.)

a) 36_{oct}

b) 25_{oct}

c) 67_{oct}

d) 47_{oct}

e) 106_{oct}

f) 236_{oct}

g) 562_{oct}

h) 700_{oct}

2) Write 23456_{oct} in expanded notation and then convert it into decimal.

3) Convert from decimal to octal.

a) 39_{dec}

b) 16_{dec}

c) 8_{dec}

d) 53_{dec}

e) 65_{dec}

f) 128_{dec}

g) 469_{dec}

4) Octal arithmetic! Think only in octal. You may use your octal multiplication table for the multiplication problems.

a) $\quad 46_{oct}$
$\quad +3_{oct}$

b) $\quad 362_{oct}$
$\quad +366_{oct}$

c) $\quad 42_{oct}$
$\quad -6_{oct}$

d) $\quad 452_{oct}$
$\quad -164_{oct}$

e) $\quad 46_{oct}$
$\quad \times 3_{oct}$

f) $\quad 56_{oct}$
$\quad \times 37_{oct}$

g) $\quad 272_{oct}$
$\quad \times 304_{oct}$

h) Challenge!
$\quad 3542_{oct} \div 6_{oct}$

Number Bases − **Group Sheet #4**

1) Write each number in expanded notation and then convert to decimal.

   a) 236_{oct}

   b) 2431_{five}

   c) $3D_{hex}$

   d) $AB6_{hex}$

2) Convert 100_{dec} to…

   a) Octal

   b) Base-five

   c) Hexadecimal

Binary (Base-two)

3) What are the digits in the binary system?

4) Count in binary until you get to six digits.

5) What are the first ten place values of the binary system? (Write them in decimal.)

6) Convert to decimal.

   a) 101_{bin}

   b) 1000_{bin}

   c) 1110_{bin}

   d) 10100_{bin}

7) Convert to binary.

   a) 6_{dec}

   b) 15_{dec}

   c) 16_{dec}

   d) 100_{dec}

8) Fill in each of the multiplication tables. Look for patterns!

Hexadecimal Times Table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0																
1																
2																
3																
4																
5																
6																
7																
8																
9																
A																
B																
C																
D																
E																
F																

Base-Five Table

	0	1	2	3	4
0					
1					
2					
3					
4					

Binary Table

	0	1
0		
1		

Number Bases − **Practice Sheet #4**

1) Write each number in expanded notation and then convert to decimal.

a) 64_{oct}

b) 364_{oct}

c) 2364_{oct}

d) 324_{five}

e) 33042_{five}

f) $1E_{hex}$

g) 72_{hex}

h) ABC_{hex}

2) Convert to octal.

a) 38_{dec}

b) 91_{dec}

c) 600_{dec}

3) Convert to base-five.

a) 38_{dec}

b) 91_{dec}

c) 600_{dec}

4) Convert to hex.

a) 38_{dec}

b) 91_{dec}

c) 600_{dec}

5) Write down the three numbers that follow each given number.

a) 898_{dec}

b) 898_{hex}

c) 776_{oct}

d) 424_{five}

e) $D9_{hex}$

f) $9FFF_{hex}$

6) *Count backwards!* Write down the three numbers that precede each given number.

a) 101_{oct}

b) 4701_{oct}

c) 200_{five}

d) $D0_{hex}$

e) 101_{hex}