BUILDING
Number Systems

FINAL TEST

Add these roman numerals without converting them to Arabic numerals.

1) MMDCLXXXIV
 + CCLXXVI

2) CMLXI
 + CDXXXVII

Add these base two numbers and give the answers in base two.

3) 100110_{two}
 + 110011_{two}

4) 10110001_{two}
 + 11000101_{two}

5) 1000111_{two}
 + 11101_{two}

Subtract the following in base two.

6) 1100101_{two}
 -- 1001100_{two}

7) 1011101_{two}
 -- 1001010_{two}

8) 1110101_{two}
 -- 111001_{two}

Multiply the following base two numbers.

9) 110111
 x 101_{two}

10) 101110
 x 1101_{two}

11) 1011010
 x 111_{two}

Divide the following base two numbers.

12) $100000 \overline{)100100000}_{two}$

13) $1010 \overline{)101101000}_{two}$

Fill in the blanks to make the equations true.

14) 64_{ten} = _____eight

15) 123_{eight} = _____ ten

Add the following base eight numbers.

16) $\begin{array}{r} 5471 \\ + \ 4432_{Eight} \\ \hline \end{array}$

17) $\begin{array}{r} 2623 \\ + \ 5255_{Eight} \\ \hline \end{array}$

18) $\begin{array}{r} 4716 \\ + \ 5433_{Eight} \\ \hline \end{array}$

Subtract the following in base eight.

19) $\begin{array}{r} 3275 \\ -- \ 2626_{Eight} \\ \hline \end{array}$

20) $\begin{array}{r} 5471 \\ -- \ 4432_{Eight} \\ \hline \end{array}$

21) $\begin{array}{r} 5433 \\ -- \ 4716_{Eight} \\ \hline \end{array}$

Change problems 19 --21 to base ten and subtract

19)

20)

21)

Multiply the following in base eight.

22) $\begin{array}{r} 2375 \\ \times \ \ \ \ 76_{Eight} \\ \hline \end{array}$

23) $\begin{array}{r} 1463 \\ \times \ \ \ 136_{Eight} \\ \hline \end{array}$

24) $\begin{array}{r} 6543 \\ \times \ \ \ \ 47_{Eight} \\ \hline \end{array}$

25) 64_{ten} = _____sixteen

26) $1f_{sixteen}$ = _____ten

Add the following in base sixteen.

27) $54c7_{sixteen}$
   + $3956_{sixteen}$

28) $3f99_{sixteen}$
   + $76c6_{sixteen}$

29) $2457_{sixteen}$
   + $6678_{sixteen}$

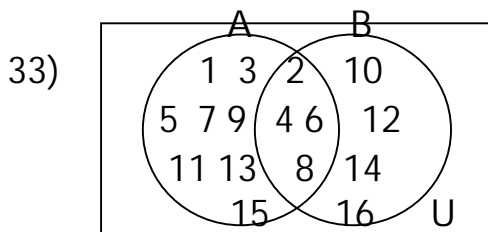ABC – 123
NOV   2002

123 – XYZ
NOV   2002
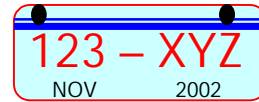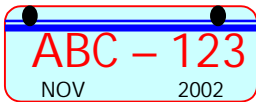
30)   License plates often have both letters and numerals like the pictures above. By using both letters and numerals, the states are able to use fewer figures to create more unique combinations for their license plates. If a state used only Hindu-Arabic numerals, how many unique license plates could be produced from six figures? __   How many unique license plates can be produced using three letters followed by three numerals like the example at the top left? ___   How many unique license plates can be produced using three numerals followed by three letters like the example at the top right? ___   How many unique license plates can be produced using six letters? ___ How many unique license plates can be produced using any combination of six letters and/or numerals? ___

Describe the solution in set notation.

31) $\{x\,|\,x \geq 12\} \cap \{x\,|\,x \leq 15\}$ 32) $\{x\,|\,x > 50\} \cup \{x\,|\,x > 20\}$

Fill in the missing information.

U = the set of all natural numbers.

33)

A   B
1 3 2 10
5 7 9 4 6   12
11 13   8 14
15   16   U

$A \cap B =$
$A \cup B =$
$(A \cup B)' =$