MTH 151 Homework #4 Key

1a. 51_{10} =

110011_{Two}

123_6

43_{12}

33_{16}

1220_3

b. 15_{10} =

1111_2

23_6

13_{12}

F_{16}

120_3

c. 89_{10} =

1011001_2

225_6

75_{12}

59_{16}

10022_3

d. 147_{10} =

10010011_2

403_6

103_{12}

93_{16}

12110_3

e. 292_{10} =

100100100_2

1204_6

204_{12}

124_{16}

101211_3

f. 874_{10} =

1101101010_2

4014_6

$60A_{12}$ or $60t_{12}$

$36A_{16}$

1012101_3

g. 3921_{10} =

111101010001_2

30053_6

2329_{12}

$F51_{16}$

12101020_3

h. $13,632_{10}$ =

11010101000000_2

1430406

$7t80_{12}$

3540_{16}

200200220_3

1i. $205,466_{10} =$

1100100010100111010_2

4223112_6

$9ttt2_{12}$

$3229A_{16}$

$10110221121 2_3$

j. $8,531,274_{10} =$

$100000100010110101001010_2$

502504350_6

2104140_{12}

$822D4A_{16}$

$12100110220101 0_3$

2a. $3\times5^4+4\times5^3+4\times5^2+4\times5^1+2\times5^0 = 2497_{10}$

b. $6\times9^3+1\times9^2+8\times9^1+5\times9^0 = 4532_{10}$

c. $2\times3^5+2\times3^4+1\times3^3+0\times3^2+1\times3^1+2 = 683_{10}$

d. $12\times16^5+15\times16^4+1\times16^3+10\times16^2+8\times16^1+7\times16^0 = 13,572,743_{10}$

e. $8\times11^4+8\times11^3+7\times11^2+0\times11^1+3\times11^0 = 128,626_{10}$

f. $1\times2^8+0\times2^7+1\times2^6+1\times2^5+1\times2^4+0\times2^3+0\times2^2+0\times2^1+1\times2^0 = 369_{10}$

g. $4\times12^4+1\times12^3+5\times12^2+3\times12^1+3\times12^0 = 1,328,871_{10}$

h. $3\times8^2+6\times8^1+7\times8^0 = 247_{10}$

3a.
$$\begin{array}{r} {\scriptstyle 1\ 1\ 1\ 1} \\ 34432 \\ 43 \\ \hline 40030_5 \end{array}$$ five

b.
$$\begin{array}{r} {\scriptstyle 1} \\ 16185 \\ 88703 \\ \hline 105888_9 \end{array}$$ nine

c.
$$\begin{array}{r} \text{CO2} \\ 3\text{BC} \\ \hline \text{FBE}_{16} \end{array}$$ sixteen

3d. $10^{\overset{0}{\cancel{1}}\overset{10}{\cancel{0}}}1110$
$-\quad 111010$
Two
100110100_2

e. $\overset{6}{\cancel{7}}\overset{7}{\cancel{0}}266$
$-\quad 2406$
eight
65500_8

f. $212\overset{1}{\cancel{2}}01221$
$-\quad 200121021$
Three
12010200_3

4a. 1

b. $-14+5=-9+5=-4+5=1$

c. 4

d. 5

e. 3.

f. 1

g. 14

h. 52

i. 56

j. 138

5a. $7n+3=x$, n an integer

b. $5x-3=4n+7$

$5x=4n+10=4m+2$

$x=\frac{4m+2}{5}$ m an integer

6a. $(12+7) \bmod 4 = 19 \bmod 4 = 3$

b. $(35-22) \bmod 5 = 13 \bmod 5 = 3$

c. $(5 \cdot 8) \bmod 3 = 40 \bmod 3 = 1$

d. $[4 \cdot (13+6)] \bmod 11 = 76 \bmod 11 = 10$

e. $(32 \cdot 21) \bmod 8 = 672 \bmod 8 = 0$