T101 In Class Review for Chapter 3 (3.1–3.3 NAMES_____

SPRING 2009 _____

1) What is the fewest number of pieces you can receive in exchange for 8 units, 5 longs and 2 flats the in base six? 1) _____

2) Jim was paid $950 a month for his first 9 months of work and then received a $40 raise for his next three months. How much money did he make for the first year? 2) _____

3) If q and r are whole numbers such that $210 = 6q + r$ and $0 \le r < 6$, find q and r. 3) _____

4) Write the first fifteen counting numbers (beginning with 1) in base six. 4) _____

5) What is the largest three digit number in base eight 5) _____

6) A number leaves a remainder of 6 when divided by 12. What is the remainder when divided by 6. Justify your answer. 6) _____

7) What base ten numbers are represented by the following Roman numerals? 7) a. _____

a) XXIX b) MCMLXXVI c) MDCCLXIX b. _____

d) $\overline{\text{XI}}\text{XI}$ e) $\overline{\overline{\text{X}}}\text{DCXLIX}$ f) $\overline{\overline{\text{III}}}\text{DCXLIV}$

c. _____

d. _____

e. _____

f. _____

8) Write the number preceding and succeeding each of the following.

a. TTE_{twelve}

b. 425_{six}

c. MCCLXX

8) a. _____

b. _____

c. _____

9) Write the following as Roman numerals:

a) 76 b) 101 c) 189 d) 44 e) 148 f) 962

9) a. _____

b. _____

c. _____

d. _____

e. _____

f. _____

10) Write each of the following in the indicated base.

a. 1001_{two} to base ten

b. 2367 to base nine

c. 231_{four} to base 12

d. $27TE_{twelve}$ to base six

10) a. _____

b. _____

c. _____

d. _____

11) Find the base indicated by the letter b:

a) $67 = 61_b$ b) $12 = 1100_b$ c) $234 = 176_b$

11) a. _____

b. _____

c. _____

12) Explain whether the set A ={0, 3, 6, 9} is closed with respect to addition. Answer yes or no. 12) _____

13) Find the missing numbers in each of the following: 13)

a. 8 _ 7
− 4 8 9
__0 8

b. 2 3 4
__8__
+ 8__7
1 9 6 8

14) Use scratch arithmetic to perform the following operations. 14) _____

43_{five}
34_{five}
44_{five}
24_{five}
$+ \underline{42_{five}}$

15) Multiply 325 • 68 using lattice multiplication. Show your work. 15) _____

16) Perform the following operations. 16) a. _____

a. 4214_{five}
$+ \underline{444_{five}}$

b. 10011_{two}
$- \underline{1111_{two}}$

c. 234_{six}
$\times \underline{55_{six}}$

d. $3023_{four} \div 13_{four}$

b. _____

c. _____

d. _____

17) Place the digits 2, 4, 5, 6, 8 in the boxes to obtain 17) a. _____

a. The greatest sum
□□□
$+ \underline{\square\square}$

b. The smallest product
□□□
$\times \underline{\square\square}$

b. _____

18) Steve's checking account at the beginning of the month has a balance of $357. During the month he wrote seven checks for $17, two checks for $22, and one check for $162. He made two deposits for $96. What is his new balance? 18) _____

19) Pete, Tom and Charlie decided to share the expense for a class party. Pete caught $35 worth of pizza, Tom bought $15 worth of ice cream, and Charlie bought $16 worth of soft drinks. How much should each person pay in order that each of them spend the same amount of money and how might they accomplish this? 19) _____

20) Use long division to find the following quotient. Show all work. 20) _____

$11678 \div 45$

21) Give the place value of the underlined digit. 21) a. _____

a. $7\underline{5}342$ b. $2\underline{4}53_{six}$ c. $1\underline{0}0101_{two}$

b. _____

c. _____

22) Which properties can be used to simplify this computation? 22) _____

$47 \cdot 37 + 37 \cdot 53$

23) What is a • b in this division problem? 23) _____

$$a\overline{)c} \quad b \text{ R } r$$

24) Multiply 34 x 56 using the expanded (instructional) algorithm 24) _____

25) The values of C, K, G, and F in this number puzzle are four different digits from 0 to 9. What are these digits? 25) _____

$$\begin{array}{r} C\,C\,C \\ +\quad K \\ \hline G\,F\,F\,G \end{array}$$

Convert the base–ten number to a number in the indicated base.

26) 503 to base eight 26) _____

Write the numeral in base ten.

27) 436_{eight} 27) _____

Perform the indicated operation.

28) $23_{\text{five}} + 24_{\text{five}}$ 28) _____

29) $111_{\text{two}} - 11_{\text{two}}$ 29) _____

Multiply using the method indicated.

30) 308 × 58; conventional algorithm 30) _____

Perform the following division using the short division method. Show all steps.

31) $5\overline{)36829}$ 31) _____

Convert the base–ten number to a number in the indicated base.

32) 246 to base twelve 32) _____

Solve the problem.

33) The fuel mileage on Ryan's car is 21 miles per gallon. After filling the tank, which has a capacity of 15 gallons, how far can he go before his car runs out of gas? 33) _____

34) Pat with drew $395 from an ATM. If the ATM gives $100, $20, and $5 bills such that the total number of bills is the least, then how many of each type of bill did Pat get? 34) _____

Identify the base used in the computation.

35) $\begin{array}{r} 414 \\ +\,333 \\ \hline 1302 \end{array}$ 35) _____

Perform the indicated operation.

36) $72_{\text{eight}} - 54_{\text{eight}}$ 36) _____

Write the numeral in base ten.

37) $4e2_{\text{twelve}}$ 37) _____

Perform the indicated operation.

38)
$$\begin{array}{rrr} 5\text{ hr} & 17\text{ min} & 37\text{ sec} \\ + & 92\text{ min} & 45\text{ sec} \\ \hline \end{array}$$
38) _____

Write the numeral in base ten.

39) 42_{five} 39) _____

Convert the base–ten number to a number in the indicated base.

40) 329 to base six 40) _____

Estimate the answer to the problem.

41) Each gallon of porch and deck paint covers 200 square feet. How many gallons are needed to cover 1539 square feet? 41) _____

Simplify the following. Leave answer as a power.

42) $7^{14} \cdot 91^{32} \cdot 13^{14}$ 42) _____

43) $70^{92} \cdot 70^{44} \cdot 70^{9}$ 43) _____

Write the following as a base–ten numeral.

44) $8 \cdot 10^2 + 4 \cdot 10 + 5$ 44) _____

45) Add 357 + 759 using the instructional algorithm. Show and explain each step. 45) _____

46) Draw base pieces to represent 324_{seven} 46) _____

1) 2 units, 0 longs, 3 flats
2) $11,520
3) r = 0 q = 35
4) (1, 2, 3, 4, 5, 10, 11, 12, 13, 14, 15, 20, 21, 22, 23)$_{six}$
5) 777
6) 0
7) a) 29 b) 1976 c) 1769 d) 11,011 e) 10,000649 f) 3,000,644
8) a. TTT$_{twelve}$ TEO$_{twelve}$ b. 424$_{six}$ 430$_{six}$ c. MCCLXIX MCCLXXI
9) a) LXXVI b) CI c) CLXXXIX d) XLIV e) CXLVIII f) CMLXII
10) a. 9 b. 3220$_{nine}$ c. 39$_{twelve}$ d. 33135$_{six}$
11) a) b = 11 b) b = 2 c) b = 12
12) No 9 + 9 = 18 and 18 is not in the set
13) a. 9, 4 b. 8, 7, 4
14) 402$_{five}$
15) 22,100
16) a. 10213$_{five}$ b. 100$_{two}$ c. 23122$_{six}$ d. 131$_{four}$
17) 862 + 54 = 916 others b. 468 x 25 = 11700
18) $224
19) They each owe $22. Tom needs to give Pete $7 and Charlie needs to give Pete $6.
20) 259 R23

$$\begin{array}{r} 259 \\ 45\overline{)11678} \\ \underline{90} \\ 267 \\ \underline{225} \\ 428 \\ \underline{405} \\ 23 \end{array}$$

21) a. thousands b. 6^2 or 36 c. 2^4 or 16
22) commutative and distributive
23) c – r
24)

$$\begin{array}{r} 34 \\ \times\ 56 \\ \hline 24 \\ 180 \\ 200 \\ \underline{1500} \\ 1904 \end{array}$$

25) C = 9, G = 1, K = 2, F = 0
26) 767$_{eight}$
27) 286

28) 102_{five}
29) 100_{two}
30) 17,864
31) 7365 R 4
32) 186_{twelve}
33) 315 miles
34) 3 $100–bills, 4 $20–bills, and 3 $5–bills
35) Base five
36) 16_{eight}
37) 710
38) 6 hr 50 min 22 sec
39) 22
40) 1305_{six}
41) 8
42) 91^{46}
43) 70^{145}
44) 845
45)
$$\begin{array}{rl} 357 & \\ +\,759 & \\ \hline 16 & \text{Add ones} \\ 100 & \text{Add tens} \\ 1000 & \text{Add hundreds} \\ \hline 1116 & \end{array}$$
46)