

HOMEWORK: 1 – 33 odd, 39

OBJECTIVES:

- ❖ Analyze place value and arithmetic in a different base

OTHER NUMBER SYSTEMS

1. Our country and most other countries use base-ten numeration systems.
2. Any number greater than 1 could be used as a base. The Babylonians used base 60, the Mayans used base 20, computers use base 2, 8, and 16, and some goods are in base 12 (eggs and pencils). Note: That a gross is $12^2 = 144$.
3. Convert a number from one base to another
 - A. Base eight to base ten
In base eight, the largest digit in the one's place is 7. Eight is written as 10.
 - i. Convert 45_{eight} to base ten.

 - ii. Convert 674_{eight} to base ten

 - B. Base ten to base eight

C. Base ten to base five. In base five, the largest digit in the one's place is 4, five is written as 10. Imagine a country where they only have the coins: quarters, nickels and pennies. Hopefully you remembered your manipulatives: 8 quarters, 8 nickels, and 8 pennies.

i. How would you form 24 cents? (That is write 24 in base-five)

ii. How would you form 93 cents?

iii. How would you form 113 cents?

D. Base five to base ten

i. Convert 140_{five} to base ten

ii. Convert 224_{five} to base ten

E. Base two to base ten. In base two, the largest digit in the one's place is 1, two is written as 10.

i. Convert 110011 (base two) to base ten

ii. Convert 65 (base ten) to base two

4. Algorithms in base five (The addition and multiplication table can be used.)

Partial sums: $31_{\text{five}} + 22_{\text{five}}$

Partial differences: $32_{\text{five}} - 14_{\text{five}}$

Partial Products: $33_{\text{five}} \times 42_{\text{five}}$

Repeated Subtraction: $324_{\text{five}} \div 4_{\text{five}}$

Compute: $32_{\text{eight}} + 66_{\text{eight}}$