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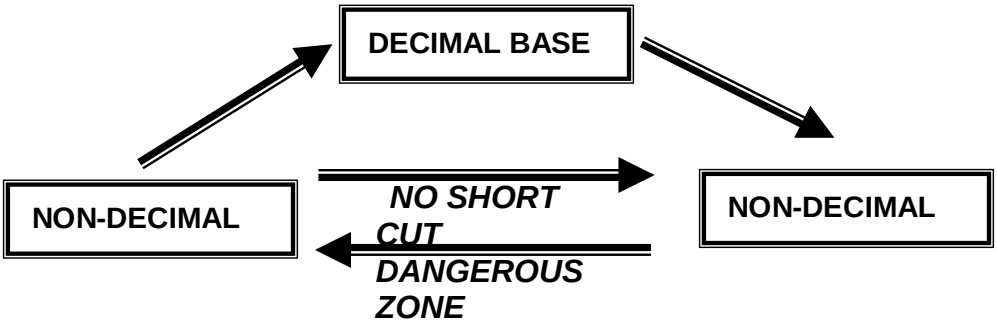
P.7 Mathematics class work Notes Week one(3/June/2020)

TOPIC: NUMERATION SYSTEM AND PLACE VALUES.
SUBTOPIC: CHANGING FROM A NON DECIMAL TO A NON DECIMAL BASE.

Note: Changing from a non decimal to a non decimal base, we express the given numeral into base ten then express it to the required base.



Examples.

1. Change 43_{five} to base seven.

43_{five} to base ten first.

$4^{1}3^{0}{}_{five}$ = $(4x5^{1})$ +
= $(3x5^{0})$
$(4x5) + (3x1)$
= $20 + 3$
= **$\underline{23_{ten.}}$**

Then change 23_{ten} to base seven.

B	NO	B
7	23	2
7	3	3
	0	

$\underline{43_{five} = 32_{seven.}}$

ACTIVITY.
1. Change 101_{two} to base three.
2. Convert 35_{six} to base five.
3. Change 413_{five} to a senary base.
4. Convert 18_{nine} to base three.
5. Change 34_{five} to base two.
6. Convert 26_{seven} to base four

TOPIC: NUMERATION SYSTEM AND PLACE VALUES. SUBTOPIC: FINDING THE MISSING BASE USED.

1. Find the value of n given that $32_{n} = 17_{ten.}$

$(3xn^{1}) + (2xn^{0})$ = $(1x10^{1}) + (7x10^{0})$
$(3xn) + (2x1)$ = $(1x10) + (7x1)$
$3n + 2$ = $10 + 7$
$3n + 2$ = 17

$3n + 2 - 2 = 17 - 2$

$3n = 15$

$\frac{3n}{3} = \frac{15}{3}$

$n = 5$

n = base five.

2. Given that $14_k = 1010_{two}$. Find the value of k.

$(1xk^1) + (4xk^0) = (1x2^3) + (0x2^2) + (1x2^1) + (0x2^0)$

$(1xk) + 4x1) = (1x2x2x2) + (0x2x2) + (1x2) + (0x1)$

$k + 4 = 8 + 0 + 2 + 0$

$k + 4 = 10$

$k + 4 - 4 = 10 - 4$

$k = 6$

k = base six.

3. Given that $100_r = 4_{ten}$. Find the value of r.

$(1xr^2) + (0xr^1) + (0xr^0) = (4x100)$

$(1xrxr) + (0xr) + (0x1) =$

$(4x1)\ r^2 + 0 + 0 = 4$

$\sqrt{r^2} = \sqrt{4}$

$r = 2$

r = base two

4. Given that $k^2 = 24_{six}$. Find the value of k.

$K^2 = (2x6^1) + (4x6^0)$

$K^2 = (2x6) + (4x1)$

$K^2 = 12 + 4$

$K^2 = 16$

$\sqrt{K^2} = \sqrt{16}$

$K = 4$

K = base four

5. Given that $2P^2 = 33_{five}$. Solve for p.

$\frac{2p}{2} = (3x5^1) + (3x5^0)$

$\frac{2p}{2} = (3x5) + (3x1)$

$\frac{2p}{2} = 15 + 3$

$\frac{2p}{2} = 18$

$\frac{2p}{2} = \frac{18}{2}$

$P^2 = 9$

$\sqrt{P^2} = \sqrt{9}$

P = 3.

ACTIVITY.

1. Find the value of the unknown in the following.
   a) $43_k = 23_{ten}$
   b) $21_p = 10101t_{wo}$.

c) $15_{six} = 21_{r}$.
d) $201_{n} = 34_{five}$.

2. Given that $r2 = 221_{three}$. Find the value of r.
3. Find the value of h if $2h^2 = 44_{seven}$

TOPIC: NUMERATION SYSTEM AND PLACE VALUES. SUBTOPIC: ADDITION OF BASES.

1. Add:
$$\begin{array}{r} {\scriptstyle 1\ 1} \\ 2\ 4\ 3_{five} \\ +\ 2\ \ 1\ 0_{five} \\ \hline \mathbf{1\ 0\ 0\ 3_{five}} \end{array}$$

Base five digits are; 0, 1, 2, 3, 4.

3 + 0 = 3 ÷

4 + 1 = 5 5 5 = 1 r 0

1 + 2 + 2 = 5 5 ÷ 5 = 1 r 0

2. Work out: $1011_{two} + 111_{two} + 1001_{two}$.

$$\begin{array}{r} 1011_{two} \\ 1001_{two} \\ +\ \ 111_{two} \\ \hline \mathbf{11011_{two}} \end{array}$$

ACTIVITY.

Work out the following additions.

1. 203_{four} + 112_{four}. 2. 101_{two} + 111_{two}.
3. $43_{five} + 121_{five}$.
4. $303_{five} + 202_{five}$
5. $101_{two} + 11_{two} + 1_{two}$.

TOPIC: NUMERATION SYSTEM AND PLACE VALUES. SUBTOPIC: SUBTRACTION OF BASES.

1. Subtract:
$$\begin{array}{r} 1011_{two} \\ -\ \ 11_{two} \\ \hline \mathbf{1000_{two}.} \end{array}$$

2. Subtract 23_{five} from 342_{five}.

$$\begin{array}{r} 3\ 4\ 2_{five} \\ -\ \ 2\ 3_{five} \\ \hline \mathbf{3\ 1\ 4_{five}} \end{array}$$

2 is less than 3 so we get one five and break it, then add to the 2.

5 + 2 = 7 then subtract 3 from 7

7 – 3 = 4

When we get one five from a 4, we remain with 3. So 3 – 2 = 1. And 3 take away nothing remains 3.

ACTIVITY.

Work out the following numbers.

1. Subtract: $1010_{two} – 100_{two}$.
2. Subtract: 202_{four} -13_{four}.
3. Subtract: 101_{two} from 111_{two}.
4. Subtract: 234_{five} from 404_{five}.
5. Subtract: 66_{ten} from 111_{ten}.