Group Homework 3

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1. 604.124_8 to base $12 = \boxed{284.1B7_{12}}$

   $= 6 \times 8^2 + 0 \times 8^1 + 4 \times 8^0 + 1 \times 8^{-1} + 2 \times 8^{-2} + 4 \times 8^{-3} = 388.1340625_{10}$

   $n \geq 3log_{12}8$, $n = 3$

$388 \div 12$	$=$	32	$R4$	$12 \times .1640625$	$=$	$1 + .96875$	
$32 \div 12$	$=$	2	$R8$	$12 \times .96875$	$=$	$11 + .6142$	
$2 \div 12$	$=$	0	$R2$	$12 \times .6142$	$=$	$7 + .3704$	round up

2. 374.24_{13} to base $8 = \boxed{1132.133_8}$

   $= 3 \times 13^2 + 7 \times 13^1 + 4 \times 13^0 + 2 \times 13^{-1} + 4 \times 13^{-2} = 602.177514792_{10}$

   $n \geq 2log_8 13$, $n = 3$

$602 \div 8$	$=$	75	$R2$	$8 \times .177514792$	$=$	$1 + .420118336$	
$75 \div 8$	$=$	9	$R3$	$8 \times .420118336$	$=$	$3 + .360946688$	
$9 \div 8$	$=$	1	$R1$	$8 \times .360946688$	$=$	$2 + .887573504$	round up
$1 \div 8$	$=$	0	$R1$				

3. $3A4.24_{16}$ to base $5 = \boxed{12212.0323_5}$

   $= 3 \times 16^2 + 10 \times 16^1 + 4 \times 16^0 + 2 \times 16^{-1} + 4 \times 16^{-2} = 932.140625_{10}$

   $n \geq 2log_5 16$, $n = 4$

$932 \div 5$	$=$	75	$R2$	$5 \times .140625$	$=$	$0 + .703125$	
$186 \div 5$	$=$	37	$R1$	$5 \times .703125$	$=$	$3 + .515625$	
$37 \div 5$	$=$	7	$R2$	$5 \times .515625$	$=$	$2 + .578125$	
$7 \div 5$	$=$	1	$R2$	$5 \times .578125$	$=$	$2 + .890625$	round up
$1 \div 5$	$=$	0	$R1$				

4. $427.2B_{14}$ to base $6 = \boxed{3443.111_6}$

$= 4 \times 14^2 + 2 \times 14^1 + 7 \times 14^0 + 2 \times 14^{-1} + 11 \times 14^{-2} = 819.198979591_{10}$

$n \geq 2log_6 14$, $n = 3$

$819 \div 6$	$=$	136	$R3$	
$136 \div 6$	$=$	22	$R4$	
$22 \div 6$	$=$	3	$R4$	
$3 \div 6$	$=$	0	$R3$	

$6 \times .198979591$	$=$	$1 + .193877551$	
$6 \times .193877551$	$=$	$1 + .163265306$	
$6 \times .163265306$	$=$	$0 + .9795991836$	round up

5. 344.12_5 to base $20 = \boxed{4J.A8_{20}}$

$= 3 \times 5^2 + 4 \times 5^1 + 4 \times 5^0 + 1 \times 5^{-1} + 2 \times 5^{-2} = 99.52_{10}$

$n \geq 2log_{20} 5$, $n = 2$

$99 \div 20$	$=$	4	$R19$	
$4 \div 20$	$=$	0	$R4$	

$20 \times .52$	$=$	$10 + .4$	
$20 \times .4$	$=$	$8 + 0.0$	round down

6. $3B74.2C4_{18}$ to base $9 = \boxed{32054.1304_9}$

$= 3 \times 18^3 + 11 \times 18^2 + 7 \times 18^1 + 4 \times 18^0 + 2 \times 18^{-1} + 12 \times 18^{-2} + 4 \times 18^{-3}$
$= 21190.148834019_{10}$

$n \geq 3log_9 18$, $n = 4$

$21190 \div 9$	$=$	2354	$R4$	
$2354 \div 9$	$=$	261	$R5$	
$261 \div 9$	$=$	29	$R0$	
$29 \div 9$	$=$	3	$R2$	
$3 \div 9$	$=$	0	$R3$	

$9 \times .148834019$	$=$	$1 + .339506171$	
$9 \times .339506171$	$=$	$3 + .055555539$	
$9 \times .055555539$	$=$	$0 + .499999851$	
$9 \times .499999851$	$=$	$4 + .499998659$	round down

7. 120221_3 to base $9 = \boxed{527_9}$

8. 322.14_8 to base 4
$= 011010010.001100_2$
$= \boxed{3102.030_4}$

9. 374.24_9 to base 27
$= 102111.021100_3$
$= \boxed{BD.79_{27}}$

10. 3112.22_4 to base $16 = \boxed{D6.A_{16}}$