

Math 125 – Practice Exam Questions

1. Add the following  $125_{seven} + 63_{seven}$   
A.  $188_{seven}$    B.  $211_{seven}$    C.  $222_{seven}$    D.  $221_{seven}$    E.  $111_{seven}$
2. The roman numerals system (XXIV etc.) is a place value system.  
T. True      F. False
3. Nearly all present-day societies use the Hindu-Arabic numeration system.  
T. True      F. False
4. How many hundredths are in 4.2?  
A. 4200      B. 2      C. 0      D. 42      E. 420
5. How many groups of whole tens are in 9,127.69?  
A. 2      B. 912.769      C. 91      D. 912      E. 913.231
6. Choose the correct inequality:  $204_{six}$  \_\_\_\_\_  $204_{seven}$   
A. <      B. >      C. =      D.  $\phi$       E.  $\infty$
7. How many numerals do we have in base five?  
A. Five      B. Ten      C. Four      D. Zero      E. Six
8. When counting, what comes after  $777_{eight}$  in base eight?  
A.  $778_{eight}$       B.  $779_{eight}$       C.  $800_{eight}$       D.  $770_{eight}$       E.  $1,000_{eight}$
9. When operating in base b, how would we represent the expression “ $b + b^4 + 3b^3$ ”?  
A.  $113_b$       B.  $13010_b$       C.  $1301_b$       D.  $13001_b$       E.  $131_{three}$
10. Subtract the following  $125_{seven} - 63_{seven}$   
A.  $62_{seven}$       B.  $52_{seven}$       C.  $42_{seven}$       D.  $32_{seven}$       E.  $22_{seven}$

11. *Perform quantitative analysis.* Roger's big dog weighs five times as much as his little dog. The little dog weighs  $\frac{2}{3}$  as much as his medium-sized dog. His medium-sized dog weighs 9 pounds more than his little dog. How much does the big dog weigh?

A) List three quantities associated with this problem. If possible, give its value.

1. \_\_\_\_\_ 2. \_\_\_\_\_  
3. \_\_\_\_\_

B) This diagram was provided by a 5th grader. In the space below, explain why it is not helpful.



C) Draw an appropriate diagram and use it to solve the problem.

12.  $2103_{\text{five}} = \underline{\quad?} \text{ten}$

13.  $2103_{\text{ten}} = \underline{\quad?} \text{eight}$

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14.  $301_{\text{four}} + 213_{\text{four}} = \underline{\quad? \quad}_{\text{four}}$

14.  $301_{\text{four}} - 213_{\text{four}} = \underline{\quad? \quad}_{\text{four}}$

16.  $202201_{\text{three}} = \underline{\quad? \quad}_{\text{seven}}$

15. *Solve the following problem.* Make sure to support your answer by **showing your work**.

(A) Brian O'Connor and Dominic Toretto are infamous street racers. They decided one night to race on a 20 mile straightaway. Toretto is confident that he will win as he has won so many times in the Fast and Furious movies and gives O'Connor a 2 second head start. On average, O'Connor drives 120 miles per hour and Toretto drives 180 miles per hour. Who wins the race?

(B) Suppose Toretto gave him a 4 second head start instead. Who would win the race in this scenario?

1. Finish the following chart by counting in base 5 and base 8:

<b>Base 10</b>	0 1 2 3 4 5	6 7 8 9 10	11 12 13 14 15
<b>Base 5</b>	0 1 2		
<b>Base 8</b>	0 1 2		

<b>Base 10</b>	16 17 18 19 20	21 22 23 24 25	26 27 28 29 30	31 32 33 34 35
<b>Base 5</b>				
<b>Base 8</b>				

2. Use your chart from question one to fill in the following blanks:

(A)  $33_{\text{five}} = \underline{\hspace{2cm}}_{\text{ten}}$

(C)  $33_{\text{ten}} = \underline{\hspace{2cm}}_{\text{five}}$

(B)  $33_{\text{eight}} = \underline{\hspace{2cm}}_{\text{ten}}$

(D)  $33_{\text{ten}} = \underline{\hspace{2cm}}_{\text{eight}}$

3. In the space below, represent the following numbers using **base block diagrams**

(A) 709

(B)  $2120_{\text{four}}$

4. Convert the following numbers from base 10 into base 5. Express your answer in numeric form.

(A) 127

(B) 555

4. Convert the following numbers from base 7 into base 10. Express your answer in numeric form.

(A)  $603_{\text{seven}}$

(B)  $1041_{\text{seven}}$