

Number Bases

Place all answers in the blank space provided. Calculators are permitted. You are not expected to answer all questions.

_____ Q1. Write 2012 in base 12. Use symbols "A" for 10 and "B" for 11.

_____ Q2. Write 2012_{12} in base 10.

_____ Q3. Write 2012_4 in base 2.

_____ Q4. Compute $54321_6 + 12345_6$ leaving your answer in base 6.

_____ Q5. Compute $654321_7 - 123456_7$ leaving your answer in base 7.

_____ Q6. Convert BAD_{16} to octal.

_____ Q7. Find the smallest positive integers a and b that make the equation $1000_a = 100_b$ true.

_____ Q8. Solve the equation $1000000_2 = 100_b$ for b .

_____ Q9. Find the largest 9 digit base 3 number and write it in decimal.

_____ Q10. Consider a base 26 system with digits A=0, B=1, ..., Z=25. Find DOG+CAT in this system and express your answer in decimal.

_____ Q11. Order these numbers from smallest to largest: $140_8, 1211_3, 322_4$

_____ Q12. Write the binary number 1101.1011 in decimal.

_____ Q13. Compute $11_2 + 12_3 + 13_4 + \dots + 19_{10}$ writing the answer in decimal.

_____ Q14. Leaving your answer in base 5, write the square of the number 314_5 .

_____ Q15. The base (-4) numeral 312_{-4} is defined as $3(-4)^2 + 1(-4)^1 + 2(-4)^0 = 45$. Find the decimal value of the base for numeral 22133_{-4}

_____ Q16. Write the decimal number 7.75 in binary.

_____ Q17. The multiplication problem $23_b \cdot 13_b = 310_b$ is correctly done in base b , a positive integer. What is base b ?