Mental Math
Test #401

Name: _____

ID Number: _____

School: _____

Division (circle one):

Mu   Alpha   Theta   Sponsor

For each of the following, find:

____1. 13x15

____2. $39^2 - 21^2$

____3. Smaller angle(in degrees) between hour and minute hand between 7:40

____4. Probability of drawing two cards of the same suit when drawing without replacement from a standard deck of cards

____5. Average speed if I go from Gainesville to Tampa at 20mph, and Tampa to Gainesville at 30mph without breaks

____6. Area of isosceles trapezoid with midsegment of 4 and height of 17.

____7. Number of factors in 184.

____8. How many ways can Robert organize 3 teams of 2 from 6 people?

____9. Number of diagonals in a dodecagon.

____10. Value of a such that ax+4y=10 and 6x+12y=30 has infinite solutions.

____11. Length of latus rectum of $y^2 + 4y - 13x = 9$.

____12. Volume of a sphere with surface area of 36π

____13. $3x^3 - 4x + 2 = 0$ has roots r, s, t. Find the sum of the reciprocals of the roots

____14. S_n is the sum of the first n terms of a sequence($a_1, a_2 \ldots$). If $S_n = n^2 + 3n + 2$, find a_5.

____15. x, if 3x+y+2x+2=4x+2y+19-y

____16. The longest space diagonal of an octahedron with side length 4.

____17. Remainder when 4^{91} is divided by 89.

____18. $\frac{3}{2} + \frac{9}{8} + \frac{27}{32} + \frac{81}{128} \cdots$

____19. Wiggie has \$3.20 in his piggybank. He has the same number of quarters and nickels. What is the greatest number of quarters he could have?

____20. Probability you roll two fair 6-sided dice and the sum is 8.

____21. Number of integer values that satisfy $x^2 < 69$ and $x^2 > 5$

____22. John's speed in meters per second if he runs 90 kilometers an hour.

____23. 23% of 23.

____24. Find n, if $2^0 + 2^1 \ldots 2^{11} = (2^0 + 2^1 \ldots 2^5)n$

____25. Number of terminating zeros in 28!

____26. $_5C_2 + 5 \times 2$

____27. Sum of the 4th and 5th prime numbers.

____28. $\frac{1}{8} + \frac{7}{12} + \frac{4}{3}$

____29. X if $1112_3 = 45_x$

____30. Minimum value of $x^2 - 2x - 5$

____31. Sum of digits in 6^4.

____32. Each of the letters M, R. L, and U represent a different odd integer between 2 and 10. What is the least possible value of $\frac{M \bullet R - L}{U}$?

___33. Sum of the distinct real values of x that satisfy $x^8 - 4x^6 + 8x^4 - 2x^2 - 2024$.

____34. Sum of coefficients of $(x+3)^5$

____35. a+b, if (3+i)(4+3i)(3-i)(1+i)=a+bi

____36. Number of Bob's needed to build 5 walls in 3 days, if 18 Bob's can build 15 walls in two days.

____37. Number of perfect squares between 102 and 10005

____38. What is the sum of the values for L and U which yield the greatest 6-digit number 5L5,62U that is divisible by 44?

____39. $\sqrt{175} + \sqrt{28} + \sqrt{63} + \sqrt{112}$

____40. Slope of the line that is tangent to $(x-3)^2 + (y-4)^2 = 25$ at the origin.