Mental Math

Test #643

Name: _____

ID Number: _____

School: _____

Division (circle one):

Mu   Alpha   Theta   Sponsor

_____ 1. When simplified, what is the denominator of $\frac{7}{\sqrt{11}-\sqrt{5}}$?

_____ 2. Two circles with radius 1 are drawn inside a square such that the circles do not overlap, one circle is tangent to two sides of the square only while the other circle is tangent to the other two sides of the square, and the two circles are tangent to each other. The square encloses how much area?

_____ 3. Find the larger angle, in degrees, formed by a clock's hands at 4:00 PM.

_____ 4. When multipled out, what is the units' digit of 3^{50}?

_____ 5. Evaluate: $2^{2^{2^2}}$

_____ 6. Solve for x:
$6x - 6 + 10x - 10 + 20x - 20 = 72$

_____ 7. Express 10000_3 in base 9.

_____ 8. Convert the radian-measure angle 5π to degrees.

_____ 9. Calculate the area of the region:
$|x| + |y| \leq 2$.

_____ 10. How many even, positive, prime numbers are there?

_____ 11. Evaluate:
1+2+4+8+16+32+64+128+256

_____ 12. If $a*b = 10$, $a*c = 15$, and $b*c = 6$, what is $a*b*c$?

_____ 13. Evaluate: $76 * 84$

_____ 14. How many integer solutions are there to the equation: $x^4 = |x|$?

_____ 15. A square has a diagonal of 2. What is the square's enclosed area?

_____ 16. Evaluate: $\frac{5}{3} + \frac{7}{5}$

_____ 17. Evaluate: $i^2 + i^4 + i^8$

_____ 18. Evaluate: $\frac{6!+7!+8!}{6!}$

_____ 19. Calculate the area enclosed by a hexagon with side length 2.

_____ 20. Evaluate and express in base 10:
$10000_2 + 100_2$

_____ 21. What is the 10th positive, prime number?

_____ 22. Which is greater: 20^{15} or 2015! ?

_____ 23. How many unique permutations of the letters in the word "ALPHA" exist?

_____ 24. Evaluate: $\sum_{x=1}^{10}(2x + 1)$

_____ 25. How many seconds are there for each question on this test if you spend the same amount of time on each question?

_____ 26. Evaluate: $1 + 2 * 3 - 4/5$

_____ 27. Find the product of the real zeros of:
$x^6 + 14\,x^5 - 14\,x^3 - 168\,x = 0$.

_____ 28. Which is greater, 2^{20} or 10^6?

_____ 29. How many possible orders are there to work the problems on this test? (Express in factorial notation)

_____ 30. Evaluate: $\sqrt{1800}$

_____ 31. Calculate 150% of 150.

_____ 32. A clock has a 1 meter long minute hand. How many meters will the tip of the minute hand travel in 8 minutes?

_____ 33. How many seconds are there in a day?

_____ 34. Find the median of the data set:
10, 4, 6, 2, 20, 9, 18.

_____ 35. Evaluate: $\log_2 4^2$

_____ 36. Find the product of the expected value of one roll of a standard, six-sided die and the number of edges on the die.

_____ 37. Find the remainder when 623 is divided by 9.

_____ 38. If $f(x) = x^2 + 1$, what is $f(f(2))$?

_____ 39. What is the greatest prime factor of 102?

_____ 40. Evaluate: 100!/98!