_____1.) How many positive integers are equal to the number of letters in the English spelling of the number? (For example, the word "fifteen" has only 7 letters, so it would not be counted as one of the words we are looking for). Do not count spaces or special characters… only letters!

_____2.) Initially, a certain state was considering license plates with one capital letter followed by five single-digit integers (0 thru 9). However, they ultimately decided to go with two capital letters followed by four single-digit integers. What is the positive difference in the number of possible plates offered by the two options?

_____3.) How many of the 7th roots of -1 lie in the 1st Quadrant of the complex plane?

_____4.) What is the exact value of $\sin\left(\frac{1819\pi}{6}\right)$?

_____5.) A cube of side length 10 is inscribed in a cylinder. What is the volume of the cylinder?

_____6.) Omar gives $\frac{1}{4}$ of his gumballs to Manuel, $\frac{1}{5}$ of the remaining gumballs to Rajesh, then $\frac{1}{6}$ of the remaining gumballs to Dietrich. If he never had to split a gumball into parts during any of this process, what is the smallest number of gumballs with which he could have started?

_____7.) Write the solution to the system as an ordered pair:

$7x + 3y = 35$ and $4x - 5y = -27$.

_____8.) When $x^4 - 5x^3 + kx^2 + 7x - 5$ is divided by $x + 1$, the remainder is 42. What is the value of *k*?

_____9.) Find the positive value of x so that the determinant of the given matrix has a value of 30. $\begin{bmatrix} 2 & 3 & x \\ 4 & x & 2 \\ 1 & 2 & x \end{bmatrix}$

_____10.) 50% of the 24 students in Mrs. A's class and 40% of the 25 students in Mrs. B's class are boys. In Mrs. C's class, the 6 boys represent 30% of the students. To the nearest integer, what percent of all students in the 3 classes are boys?

_____11.) How many solutions does the equation $sin(x) = \frac{1}{6}x$ have?

_____12.) Fifteen distinguishable runners run a race. How many ways are there to award gold, silver, and bronze medals (one of each)?

_____13.) The set of possible values of *k*, for which the lines $y = \frac{3}{4}x - 3$ and $y = kx - 5$ intersect in the first Quadrant, can be expressed as the open interval (a, b). What is the value of $a + b$?

_____14.) When 4 fair coins are flipped, what is the probability that 2 are heads up and 2 are heads down?

_____15.) John made 85, 76, 78, and 72 on his first 4 tests. What score does he need to make on his fifth test in order to have an average of exactly 80?

_____16.) What is the sum of ALL of the solutions to the equation:

$(2x^2 - 5x + 6)(x^2 - 7x + 4) = 0$

_____17.) Find the period of the function $f(x) = 3\cos\left(5x - \frac{\pi}{2}\right) + 4tan(2x - \pi)$.

_____18.) Calculate $(977)(1023)$.

_____19.) What is the remainder when 11^7 is divided by 1000?

_____20.) How many non-congruent rectangular prisms have positive integer side lengths and a volume of 24?

_____21.) What is the distance between the points $(-12,4)$ and $(6,-8)$ in simplest radical form?

_____22.) Find: $\lim_{x\to 2} \frac{x^3-4x^2+x+6}{x^2-3x+2}$.

_____23.) Find the x-coordinate of the x-intercept of the line $y = \frac{-3}{2}x + 8$.

_____24.) Find the area enclosed by the ellipse given by the equation: $\frac{(x-4)^2}{64} + \frac{(y+3)^2}{16} = 2$.

_____25.) A particular regular polygon is such that each interior angle is 8 times the degree measure of each exterior angle. How many diagonals does this regular polygon have?