_____ 1. A circle is inscribed in a square with area of 108. Find the area of the circle in terms of π.

_____ 2. How many 2 digit numbers contain at least one three?

_____ 3. A circle is given by $x^2+y^2-4x+10y-52=0$. Let A be the number of units in the circumference and B the number of square units in the area of the circle. Find the value of A + B in terms of π.

_____ 4. The points $(5,7),(3,a+2),(7,11)$ are collinear. Find the value of a.

_____ 5. $2\sqrt{2}$ is what percent of $8\sqrt{8}$?

_____ 6. Find the value of $x+y$ for the system
$1024^{x^2}=16^{-2y}$
$xy=-10$

_____ 7. Solve for the value of x:
$\frac{x+3}{x+2}-\frac{x-4}{x-3}=\frac{x-2}{x-3}$ where defined.

_____ 8. A is a 2 by 2 matrix whose entries are the first four prime numbers. What is the largest possible value of the determinant of A?

_____ 9. Find the positive root for $x^{-2}+x^{-1}=6$.

_____ 10. How many terms in the sequence:
$2,-6,18,-54,\ldots,-6\left(3^{22}\right)$?

_____ 11. Find the length of a side of a rhombus whose diagonals are 6 and 8.

_____ 12. Solve for the value of x:
$\log_4(x+2)=1-\log_4(3x-5)$

_____ 13. The ratio of $2x-y$ to $x+y$ is 2:3. Express the ratio of $x:y$ as a simplified fraction.

_____ 14. If $x+y=7, x^2-y^2=21$, find the value of $2x+3y$.

_____ 15. A farmer observed that among the cows and chickens in the barnyard there were 25 heads and 62 legs. How many cows were in the barnyard?

_____ 16. Give the largest root of $3+\sqrt{3x+1}=x$.

_____ 17. The measure of $\angle A$ is nine more than twice the complement of $\angle A$. Find the supplement of $\angle A$ in degrees.

_____ 18. Find the positive value for x for which $\begin{vmatrix} 3 & x \\ 2x & -2 \end{vmatrix}=-7(x+3)$.

_____ 19. The sum of all but one of the interior angles of a convex polygon equals $2570°$. Find the measure of the remaining angle in degrees.

_____ 20. Find the units digit of 19^{99}.

_____ 21. Let $A=\begin{bmatrix} x & 2 & 4 \end{bmatrix}, B=\begin{bmatrix} 4 \\ 1 \\ 2 \end{bmatrix}, AB=-4$.
Find the value of x as a simplified fraction.

_____ 22. Evaluate $(1-i)^7$.

_____ 23. Find the sum of all integral solutions to the inequality $|10x-5|\le 208$.

_____ 24. If 212 – 124 = 55, what base system was used?

_____ 25. How many ml of 5% hydrochloric acid should be mixed with 20 ml of 30% hydrochloric acid to obtain a 15% solution?