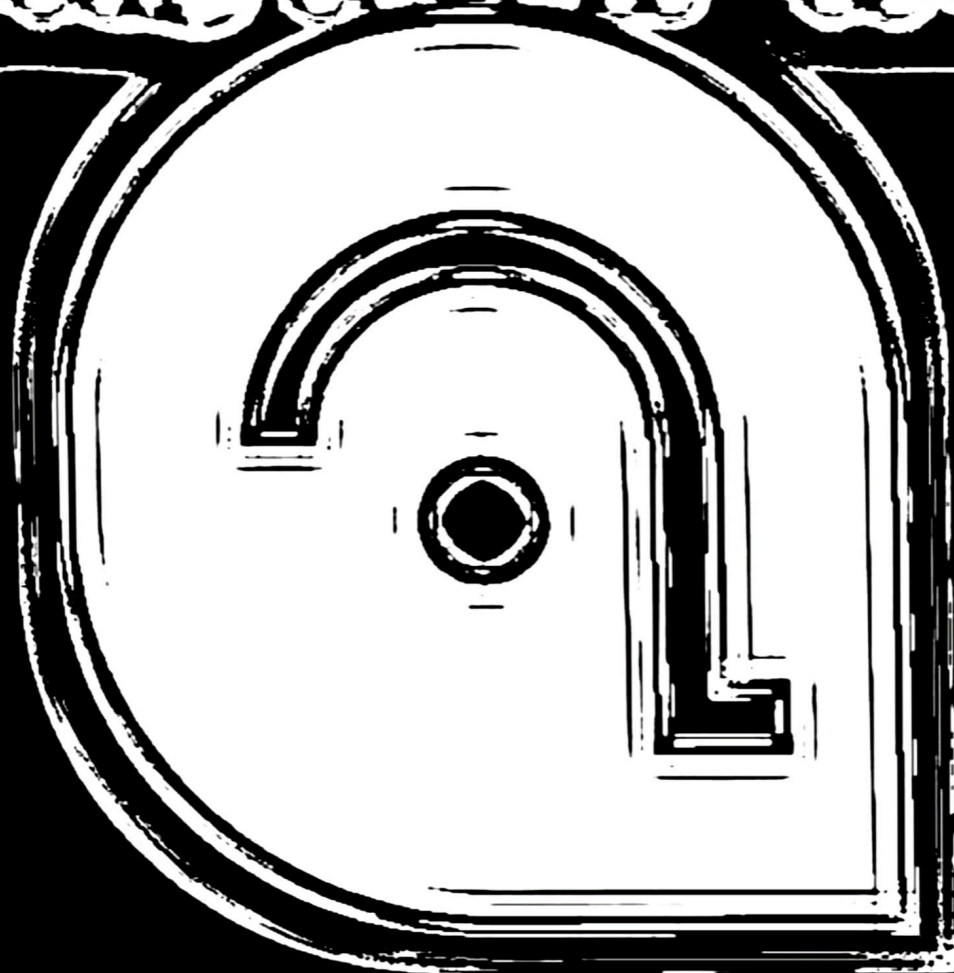


WHEEL



AXTERA

I. Fill in the blank spaces. Write the appropriate and the most simplified answer on the space provided. (1.5 each blank)

1. The truth value of p is _____ if the truth value of $(p \vee q) \Rightarrow (\neg p \vee q)$ is false.

2. Let $a + bi = (1 + i\sqrt{3})^5$. Then $a =$ _____ and $b =$ _____.

3. If $m^n = 8$ for positive integers m and n , then n^m is _____.

4. If $\cos\theta = \frac{3}{5}$, where θ is in the fourth quadrant, then $\sin\theta =$ _____.

5. The value of a for which $\tanh(2a) = \frac{1}{2}$ is _____.

6. Let $5 + e^{x+1} = 20$. Then $x =$ _____.

7. Let $\log x + \log(x-1) = \log(3x+12)$. Then $x =$ _____.

8. The distance between a point $P(5,2)$ and a line $3x-2y+1=0$ is _____.

9. The vertex of the parabola $y^2 - 6y + 8x + 25 = 0$ is _____.

II. Multiple choice. Choose the best answer. (1.5 each)

1. Let p and q be statements. Which of the following implies that $p \vee q$ is false?

A. $\neg p \vee \neg q$ is false B. $p \Rightarrow q$ is true C. $\neg p \wedge \neg q$ is true

D. $\neg p \vee q$ is true E. B and C are answers

2. Let $A = \{(x, y) : y = e^x, x \in \mathbb{R}\}$ and $B = \{(x, y) : y = x, x \in \mathbb{R}\}$. Then

A. $B \subset A$

B. $A \subset B$

C. $A \cap B = \phi$

D. $A \cup B = A$

8. Which of the following is true.

A. Any relation is a function.

B. Any function is invertible.

C. Some polynomial functions have asymptote(s).

D. Any polynomial of degree 3 has at least one zero in the complex number system.

9. For what value of b does the line $5x+by-6=0$ being perpendicular to the line $7y-4x-7=0$.

A. $\frac{4}{7}$

B. $\frac{20}{7}$

C. $-\frac{20}{7}$

D. $\frac{7}{20}$

10. $x^2 + 9y^2 - 2x + 18y + 1 = 0$ is an equation of:

A. Circle

B. Parabola

C. Ellipse

D. Hyperbola