Problem 1
What is the Domain and Range of the function

\[ f(x) = 6 + \sqrt{x - 1} \]

Problem 2
Let \( f(x) = -9x + 5 \). Does \( f \) have an inverse? If so, what is it?

Problem 3
In the year 2000, a total of 9.8 million passengers took a cruise vacation. The global cruise industry has been growing at approximately 8% per year for the last decade. Assuming that this growth rate continues, How many cruise passengers are predicted in the year 2010.

Problem 4
Suppose $1200 is deposited in an account paying a nominal interest rate of 5\% per year, how much is in the account 15 years later if the interest is compounded monthly. How much is in the account 15 years later if the interest is compounded continuously.

Problem 5
Solve EXACTLY for \( x \) in the equation:

\[ \log(9x + 1) \cdot \log(x^2 - 15) = 0 \]

TIP: Make sure you check the domain for your answers.
Problem 6
Solve EXACTLY for $x$ in the equation
\[3 \log(2x + 6) = 6\]

Problem 7
Solve EXACTLY for $x$ in the equation
\[e^{2x} + 9 = 10e^x\]

Problem 8
Find a formula for $f(x)$, an exponential function such that $f(2) = 1/27$ and $f(-1) = 27$.

Problem 9
Solve EXACTLY for $x$ in the equation
\[\ln(x - 10) - \ln(x - 2) = \ln x\]
TIP: Check the domain of your answers.

Problem 10.a
Is the function $f(x) = x^2 + 1$ even, odd, or neither?

Problem 10.b
Is the function $f(x) = x^3$ even, odd, or neither?

Problem 10.c
Is the function $f = 7x^4 + 3x^2 + 11$ even, odd, or neither?
Problem 11

Let \( f(x) \) be the quadratic function defined as

\[
 f(x) = 3x^2 - 18x - 11
\]

1. What is the vertex of \( f \).
2. What are the \( x \)-intercepts (if any). What is the \( y \)-intercepts (if any).
3. Graph \( f(x) \) labelling the position of the vertex, \( x \)-intercepts, and \( y \)-intercepts (if any).

Problem 12

Find the formula of the quadratic equation that has it’s vertex at \((3, -5)\) and goes through the coordinate \((0, 2)\).

Problem 13

Find the formula of the quadratic equation that has roots \( r_1 = -4 \) and \( r_2 = 5 \) and goes through the coordinate \((2, 36)\).

Problem 14

Find the formula for the trigonometric function that has a ‘bottom peak” at \((2, -3)\), midline at \( y = 0 \) and period 4.

Problem 15

Find the exact value of

\[
 3 \sin \left( \frac{3\pi}{4} \right) - 2 \cos \left( \frac{9\pi}{4} \right)
\]
Problem 16

Find all solutions for the equation below with $0 \leq t \leq 2\pi$

$$3 \sin t \cos t + 2 \sin t = 0$$

TIP: Be careful if you divide.