There are 20 questions worth 5 points each. Show your work in a neat and organized fashion.

1. Write the equation of the line \( y = \frac{3}{2}x - 2 \) in **standard form**.

2. Write the equation of the line passing through the points \((-3,2)\) and \((6,-2)\) in **slope-intercept form**.

3. Write an equation of a line passing through the point \((0,1)\) and **perpendicular** to the line \( y = 3x + 5 \). Write the equation in **slope-intercept form**.

4. Using the linear equations for cost and revenue given by: 
   \[ C(x) = 24x + 150 \quad \text{and} \quad R(x) = 30x \]
   a) Write a linear equation to determine profit \( P(x) \).

   b) Determine the profit when 30 units are sold.

5. Determine the domain of the function given by \( f(x) = \frac{x-5}{x^2-25} \). Write domain in interval notation.
6. Given the graph of \( f(x) = x^2 \), draw the transformation of \( g(x) = -(x + 1)^2 - 1 \). List all of your transformations of \( g(x) \) from \( f(x) \).

7. Using definitions, check if \( g(x) = \sqrt{4 + x^2} \) is even, odd, or neither.

8. Given \( f(x) = \begin{cases} 1, & \text{for } x < 0 \\ x^2, & \text{for } x \geq 0 \end{cases} \) evaluate the following:
   a) \( f(-2) \)  
   b) \( f(0) \)

9. Given \( f(x) = x^2 + 3x - 5 \) and \( g(x) = -x^2 \), find:
   a) \( (f + g)(x) \)  
   b) \( (f \cdot g)(x) \)

10. Given \( f(x) = x^3 - 2x^2 - 17x + 1 \), determine if there is a zero on the interval \([0, 1]\).
11. Given \( h(x) = (x^3 - 8)^2 \), find \( f \) and \( g \) such that \((f \circ g)(x) = h(x)\).

12. Given \( f(x) = x^2 - 1 \), find the difference quotient \( \frac{f(x+h)-f(x)}{h} \).

13. Given \( f(x) = \sqrt{x} \) and \( g(x) = x^2 + 2x + 1 \), determine \((f \circ g)(x)\), simplify.

14. For the given graph, determine the relative maxima and minima.

15. Determine whether the graph of \( y^4 = 2 + x^2 \) is symmetric to the \( x \)-axis, \( y \)-axis, or origin.
16. Determine if the following relation defines \( y \) as a function of \( x \). Justify your reasoning.
\[
\{(0,1), (2,3), (-1,0), (1,0), (-2,3)\}
\]

17. Given \( f(x) = \frac{1}{x-4} \) and \( g(x) = 4x \), find the domain of \( (f \circ g)(x) \).

18. Find the vertex of the parabola given by \( f(x) = x^2 - 7x + 6 \).

19. Determine the end behavior of the function given by \( g(x) = x^5 - 3x^3 + 2x^2 + 1 \).

20. Determine the zeros and their multiplicity for \( h(x) = 4x^3 - 16x \).