1. (4 points) Evaluate \( \log_{36} \left( \frac{1}{6} \right) \) and simplify completely.

2. (4 points) Let \( f(x) = 7 - 3x - 5x^2 \). Simplify \( f(2x - 1) \) and write your answer as a polynomial in standard form.

3. (4 points) Find an angle \( \theta \) coterminal with the angle \( \frac{21\pi}{6} \) so that \( 0 \leq \theta \leq 2\pi \).

4. (4 points) Find the area of the sector of a circle with central angle 12° if the radius of the circle is 3m.

5. (4 points) Rewrite \( \frac{-x^2}{2x-1} + \frac{3x-4}{2x-1} \) as one reduced fraction.

6. (4 points) Determine the net change and the average rate of change of the function \( f(t) = 3t - t^2 \) between \( t = 2 \) and \( t = 7 \).

7. (4 points) Perform the multiplication \( x^\frac{3}{2} \left( \sqrt{x} - \frac{1}{\sqrt{x}} \right) \) and simplify.

8. (4 points) Suppose \( 90^\circ \leq \theta \leq 180^\circ \) and \( \sin \theta = \frac{2}{9} \). Find \( \cos \theta \).

9. (4 points) Sketch the graph the function \( f(x) = 2x - x^2 \). State the domain, range, and asymptote. Label at least three points on your graph.

10. (5 points) Find an equation of the line passing through the points \((1, -2)\) and \((-5, 3)\).

11. (5 points) Find the center and the radius of the circle with equation \( x^2 + 6x + y^2 - 2y + 6 = 0 \).

12. (5 points) Simplify \((1 + \frac{1}{x})^2 - (1 - \frac{1}{x})^2\) completely.

13. (5 points) Solve the equation \( V = \frac{1}{3} \pi r^2 h \) for \( r \).

14. (5 points) Sketch the graph of the function \( f(x) = -(x - 4)^3 \) by indicating how a more basic function has been shifted, reflected, stretched, or compressed. Label all intercepts on the graph and state the end behavior.

15. (5 points) Simplify \( \frac{8a^3b^{-4}}{(2a+b)^3} \). Eliminate negative exponents in your final answer.

16. (5 points) Find all real solutions of \((2x - 5)^2 = 81\).

17. (5 points) Evaluate \( \sin(-210^\circ) \).

18. (6 points) Given \( f(x) = \frac{x-1}{x+1} \) and \( g(x) = x^2 + 1 \). Evaluate and simplify
   (a) \( g(f(\frac{3}{2})) \)
   (b) \( f(g(x)) \).

19. (6 points) Perform the indicated operations and simplify as one fraction.
   (a) \( \frac{x^2+2x-3}{x^2+8x+16} \cdot \frac{3x+12}{2x-2} \)
   (b) \( \frac{1}{x-2} + \frac{3}{(x-2)^2} \).

20. (6 points) Solve each of the following for \( x \). If there is no solution, write NO SOLUTION.
   (a) \( 5 - x = 14 - \frac{1}{2}x \)
   (b) \( \sqrt{2x + 1} + 1 = x \).

21. (6 points) Evaluate and simplify each of the following.
   (a) \( 64^{-\frac{1}{4}} \)
   (b) \( 10^{\frac{3}{4}} \cdot 10^{\frac{13}{4}} \).