1. Use order of operations to simplify: \( 5^2 - 16 \div 2^2 \cdot 4 - 1 \)

2. Let \( A = \{a, b, c\} \), \( B = \{a, c, d, e\} \), and \( C = \{a, d, f, g\} \). Find the indicated sets:

   (a) \( A \cap B \)

   (b) \( C \cup A \)

3. Simplify the exponential expression: \( \left( \frac{1x^{-2}y^3}{2x^5y^2} \right)^{-5} \)

4. Write in scientific notation: 0.0000002345

5. Rationalize the denominator: \( \frac{5}{6 + \sqrt{2}} \)

6. Perform the indicated operation: \( (10x^4 - 8x^3 + 2x^2) - (5x^4 - 3x^3 + 2x^2 - 1) \)

7. Multiply: \( (x - 3)(x^2 - 4x + 3) \)

8. Factor: \( x^3 - 3x^2 - 9x + 27 \)

9. Divide: \( \frac{x^2 - 5x - 24}{x^2 - x - 12} \div \frac{x^2 - 10x + 16}{x^2 + x - 6} \)

10. Add: \( \frac{x}{x^2 - 9} + \frac{x - 1}{x^2 - 5x + 6} \)
11. Graph the equation \( y = |x| - 1 \) and create a table for \( x = -3, -2, -1, 0, 1, 2, \) and 3.

12. Is the following equation an identity, a conditional, or an inconsistent equation?

\[ 7x + 1 = 5(x + 5) + 2x \]

13. Solve by factoring: \( x^2 - x - 6 = 0 \)

14. Solve by square roots: \( 4x^2 = 16 \)

15. Solve by completing the square: \( x^2 - 10x + 1 = 0 \)

16. Solve by quadratic formula: \( 2x^2 - 1x - 3 = 0 \)

17. Use graphs to find the set: \((-2, 2] \cap [-1, 3)\)

18. Solve the equation: \( |x + 1| = 9 \)

19. Solve the inequality: \( 9 < 2x + 3 \leq 12 \)

20. Solve the inequality: \( |2x + 3| \geq 15 \)
21. Given \( f(x) = x^2 + 3x - 1 \), find \( f(x + 1) \).

22. Determine if \( f(x) = x^3 + x^2 \) is even, odd or neither.

23. Find the slope of \((-1, 5)\) and \((2, -4)\)

24. Find the equation of a line in slope intercept form through the line \((1, 4)\) and is perpendicular to \(3x + 6y = 12\)

25. Find the average rate of change of \( f(x) = x^2 \) as changes from \( x_1 = -2 \) to \( x_2 = 3 \)

26. Find the domain of \( f(x) = \sqrt{x - 5} \)

27. Given \( f(x) = x^2 + 3 \) and \( g(x) = x - 1 \)
   
   (a) Find \((f - g)(x)\)

   (b) Find \((f \circ g)(x)\)

   (c) Find \((f \circ g)(1)\)

28. Find the midpoint of \((-3, 3)\) and \((-5, 7)\)

29. Find the distance between \((1, -2)\) and \((-2, 1)\)

30. Find the center and radius of: \((x - 12)^2 + (x + 9)^2 = 25\)
31. Given \( f(x) = 2(x + 3)^2 - 5 \)
   
   (a) Find the vertex.

   (b) Does the graph open upward or downward?

   (c) Does the graph have a maximum or minimum?

   (d) Find the domain.

   (e) Find the range.

32. Find the vertex of \( f(x) = x^2 - 2x + 8 \)

33. Given \( f(x) = x(x - 9)^3(x + 2)^2 \),

   (a) Find the behavior.

   (b) Find the zeros.

   (c) Find the multiplicity of each zero.

   (d) Find if it crosses or touches each x-intercept.

   (e) Find the y-intercept.

34. Divide. You may use the method of your choice. \( (3x^4 - 2x^3 - 1) \div (x + 1) \)

35. List all the POSSIBLE zeros of: \( f(x) = 2x^4 - 5x^2 - 4x - 16 \)

36. Given \( f(x) = \frac{2x^2 + 6x + 4}{x^2 - 3x - 10} \)

   (a) Find the domain

   (b) Find the vertical asymptotes

   (c) Find the horizontal asymptotes

37. Solve: \( \frac{1}{x-5} \geq 1 \)
38. Graph \( f(x) = \left(\frac{1}{2}\right)^x \)

39. Write in exponential form: \( x = \log_4 97 \)

40. Write in logarithmic form: \( 2^x = 5 \)

41. Evaluate: \( \log_{16} 4 \)

42. Expand: \( \log_2 \frac{x y^2}{64} \)

43. Condense: \( \ln(x) + 3 \ln(x - 2) - 5 \ln(x + 6) - \frac{1}{2} \ln(x - 3) \)

44. Solve: \( \log_3(x - 1) - \log_3(x + 2) = 2 \)

45. Solve: \( 3^{x+2} = 7^{4x-5} \)