1. (8 points) Write the complex numbers in standard form:
   (a) \( \frac{2i}{3 + 4i} \)
   (b) \( i^9 \)

2. (10 points) Find the real numbers \( x \) which satisfy the equation \( \sqrt{1 + x + x} = 5. \)

3. (6 points) Solve the inequality \( 5(x - 1) + 2 \geq 3x + 9. \) Give your answer in interval notation.

4. (8 points) Solve the inequality \( |2x - 1| < 5. \) Sketch the solution on the real number line below.
5. (8 points) Solve the inequality \( x^4 - 2x^3 \leq 0 \). Sketch the solution on the real number line below.

![Graph of \( x^4 - 2x^3 \leq 0 \)]

6. (8 points) Solve the inequality \( 1 - \frac{2}{x - 2} < 0 \). Sketch the solution on the real number line below.

![Graph of \( 1 - \frac{2}{x - 2} < 0 \)]

7. (10 points) (a) Find the slope of the straight line passing through the points \((-2, 8)\) and \((1, -1)\).

(b) Find the equation (slope intercept form) of the straight line passing through the two points in (a).

8. (8 points) (a) Use your calculator to graph the function \( f(x) = x^3 - 15x + 7 \) from \( x = -5 \) to \( x = 5 \) (use zoomfit for y range).

(b) Give the coordinates (to 3 decimal places):
   - relative maximum = 
   - relative minimum = 

(c) Specify the interval(s) on which the function is decreasing.

![Graph of \( f(x) = x^3 - 15x + 7 \)]
9. (8 points) The graph of \( y = f(x) \) is shown on the first set of axes. Sketch the graphs requested on the other two.

\[
\begin{align*}
\text{Graph of } y &= f(x) \\
y &= f(x - 1) \\
y &= 2f(x)
\end{align*}
\]

In case your pictures are not clear you might want to describe the transformations in words.

10. (10 points) \( f(x) = \frac{1}{x}, \quad g(x) = \sqrt{x - 3}. \)

(a) The domain of \( f \) is : 

(b) The domain of \( g \) is :

(c) Write a formula for \( f \circ g \) :

(d) Write a formula for \( g \circ f \) :

11. (10 points)

(a) On the same axes sketch the graph of the inverse function \( y = f^{-1}(x) \).

(b) Find the inverse function \( g^{-1}(x) \) for \( g(x) = \frac{1}{3}(x^3 - 1) \).

12. (6 points) (a) What is the slope of the straight line \( 3x + 4y = 7 \)?

(b) What is the slope of a line perpendicular to the line in (a)?