Math 100: Practice Problems for Chapter 9 Exam

1. Solve the equation \( x^2 - 6x = 16 \) by:
   
   (a) completing the square.

   (b) the quadratic formula.

2. Graph the parabola \( y = x^2 - 6x - 16 \). Label the vertex and all intercepts.

3. Simplify each complex expression into the form \( a + bi \).
   
   (a) \((4 + i)^3 \)

   (b) \(\frac{2}{3 + i} \)

4. Solve each equation using any method. Find all real and complex solutions.
   
   (a) \( x^2 - 8x = -7 \)

   (b) \((x + 2)(x + 3) = 6 \)

   (c) \(\sqrt{x} - \sqrt{3x - 1} = 1 \)

5. Lena dives from Sacramento to Reno (approximately 120 miles). One the return trip she drives 10 mph faster. The round-trip takes 4 hours. How fast did she travel on the portion of the trip from Sacramento to Reno?

6. Solve each nonlinear inequality.
   
   (a) \( x^2 - 6x < 7 \)

   (b) \(\frac{x(x + 2)}{x + 3} \geq 0 \)