**Test 1 Math 157**
Place your name in the upper right hand corner. Place your answers in the blanks at the left if possible. If you are hoping for partial marks you should show your work on a separate sheet. Relax, enjoy, and have fun. 😊

1) On the back of this paper sketch a graph of \( y = x^2 - 6x + 9 \).

2) Susan and Ken leave a campsite, Susan biking West and Ken biking South. Susan bikes 4 km/hr faster than Ken. After 3 hours they are 50 km apart. Find the speed of each biker.

3) Solve, \( \sqrt{x} + \sqrt{x - 4} = 2 \)

4) Solve, \( x^4 - 5x^2 + 4 = 0 \)

For the next two problems consider the quadratic equation and the quadratic formula.

\[ ax^2 + bx + c = 0 \]

\[ x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \]

5) What is the sum of the two solutions?

6) What is the product of the two solutions?

7) Solve for \( x \), \( x^2 - 4dx - 5d^2 = 0 \)

8) Joe can do 2 jobs in 5 hours and Chip can do a job in 1 hour. How long will it take if they work together for 2 jobs?

9) Solve, \( \sqrt{x + 3} = 2x \)

10) Find the equation of the line that connects (1,-2) and (3,2).

11) Find the equation of the line that is perpendicular to \( y = -2x + 83 \) and that passes through (2,-3).

12) Find the equation of the line that is parallel to \( y = 2x + 93 \) and that passes through (2,-1).

13) Suppose \( f(x) = 2x^2 - 4x + 3 \). Simplify the expression \( \frac{f(x + h) - f(x - h)}{2h} \)

14) What is the center and radius of the following circle? \( x^2 - 2x + y^2 + 6y = 18 \)