Lesson #13 A-2: Solving Application of Polynomial Functions and Equations
(Reference: Lesson #62, #65, #66, #76, #85, #95 & #106 in text book)

Problem

1. **Solve each of the following application problems using what you have learned in class about solving polynomial function and equations. (Create the polynomial equation and SHOW ALL OF YOUR WORK in solving the equation.)**

    1. The area of a triangle is $44m^2$. Find the lengths of the legs if one of the legs is $3m$ longer than the other leg.

    2. The top of a 15 foot ladder is 3 feet farther up a wall than the foot is from the bottom of the wall. How far is the ladder from the bottom of the wall?

    3. The sum of a number and its square is 72. Find the number.

    4. A tree is supported by a wire anchored in the ground 5 feet from its base. The wire is 1 foot longer than the height that it attaches to the tree. Find the length of the wire.

    5. The length of a rectangluar swimming pool is 2 yards more than 2 times the width. The area of the pool is 144 square yards. Find the dimensions of the pool.

    6. The length of a rectangular vegetable garden is 4 feet more than its width. After a 2 foot cement boarder is placed around the garden, the area of garden and border is 320 square feet. Find the original dimensions of the vegetable garden.

    7. Standing on the top of a house 48 feet above the ground, Matt shoots a trick basketball shot upward according to the equations $h = -16t^2 + 32t + 48$, where h is the height of the ball in feet, and t is the time in seconds. How long will it take for Matt's airball to hit the ground?

    8. While hunting, Scott shoots an arrow from the top of a 23 foot platform at a trophy buck according to the equation $h = -16t^2 + 76t + 23$, where h is the height in feet and t is the time in seconds. Sadly, his arrow misses and hits at tree. As Scott arrives, he finds that the arrow hit the tree at a height of 3 feet off the ground. How long did it take for the arrow to hit the tree?

    9. You want to make an open-top box with a volume of 500 square inches from a piece of cardboard that is 25 inches by 15 inches by cutting squares from the corners and folding up the sides. Find the possible dimensions of the box.

    10. Jordan is 2 years older than his brother James. If the product of their ages is one less than five times the sum of their ages, how old are Jordan and James?