Lesson #13 A-3: 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 height of a triangluar flag is 5 inches more than twice its base. If the flag is made of 84 square inches of fabric, what are the dimensions of the flag?

   2. The volume of a box is 405 cubic inches. If the width is 4 inches larger than the length and the height of the box is 9 inches, what are the dimensions of the box?

   3. Two positve numbers have a product of 575. If the larger number is 2 more than the smaller, what are the numbers?

   4. Cathy's rectangular flower garden has a length that is 3 feet less than twice the width. After she has her husband, David, place a 5 foot brick border around the garden, the area of the garden and border is 210 square feet. Find the dimensions of the garden without the border.

   5. The area of John's rectangular lawn and cement border is 1222 square feet. If the cement border is 2 feet wide, and the length of his lawn is 27 feet less than 3 times the width, what are the dimensions of John's lawn?

   6. The volume of a box is 12 cubic feet. The length is two more than twice the width and the height is two more than the width. What are the dimensions of the box?

   7. The number of possible high fives, H, within a group of n people is given by the formula $H = \frac{1}{2}\left(n^2 - n\right)$.

      After the Angels won the World Series, there were 66 high fives at Jon's house. How many people were at Jon's house?

   8. While tossing the football with his kids, Jon throws a ball as hard as he can to try to catch the kids by surprise. The height of the ball, h, is given by $h = -16t^2 + 8t + 9$, where t is in seconds. One of the kids makes a diving catch and catches the ball at 1 foot off the ground. How long was the ball in the air before being caught?

   9. For his 60th birthday, Robert goes skydiving. The height, h, of Robert above the ground is given by $h = -16t^2 + 2600$, where t is in seconds. Robert deploys his chute at 1000 feet above the ground. How long was Robert sky diving before he deployed his chute?

10. A gas tank is to be built like below

12 ft
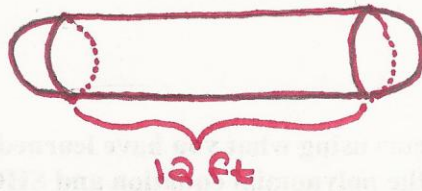
What radius should be used so that the volume is $144\pi \; ft^3$.

(HINT: The formula for Volume of A Cylinder is $v = \pi r^2 h$

and the Volume of a Sphere is $v = \frac{4}{3}\pi r^3$.)