**Quadratic Equation** (2nd degree polynomial)

**Quadratic Equation:** *ax*2 + *bx* + *c* = 0, *a* ≠ 0, where *a*, *b*, and *c* are real numbers.

**Quadratic Function:**  *f* (*x*) = *ax*2 + *bx* + *c*, *a* ≠ 0, where *a*, *b*, and *c* are real numbers.

Both can have real-number or imaginary-number solutions.

***Zeros:*** *Solutions* of *ax*2 + *bx* + *c* = 0.

**Methods of Solving \*Your Choice\***

1. **Factoring**
2. **Quadratic Formula**
3. Complete the Square (college Algebra)
4. **Square-Root Method**

**Example 1:** The product of two consecutive odd integers is 99. Find the integers.

**Example 2:** **\*Geometry\***

 Rene is setting up a holiday light display. He wants to make a ‘tree’ in the shape of two right triangles, as shown below, and has two 10-foot strings of lights to use for the sides. He will attach the lights to the top of a pole and to two stakes on the ground. He wants the height of the pole to be the same as the distance from the base of the pole to each stake. How tall should the pole be?



**Example 3:** **\*Projectile Motion\***

**Projectile Motion Formula:**

$$h(t)=-16t^{2}+v\_{0}t+p\_{0}$$

$h=$**height of the object at time** $t$

$v\_{0}=$**initial velocity**

$p\_{0}=$**initial position**

A local rocketry club held a competition for the highest launch of a model rocket. Before launch, each rocket will be placed on a 2 foot-tall platform. The power produced by the motor, will then launch the rocket at an initial velocity of 200 ft/sec. When will the rocket reach 600 feet?

**Example 4:** **\*Work Applications\* (Use proportion of time)**

 The weekly gossip magazine has a big story about the presidential election and the editor wants the magazine to be printed as soon as possible. She has asked the printer to run an extra printing press to get the printing done more quickly. Press #1 takes 12 hours more than Press #2 to do the job and when both presses are running they can print the job in 8 hours. How long does it take for each press to print the job alone?

**Example 5:** **Distance = Rate x Time**

$$Time=\frac{Distance}{Rate}$$

$$T\_{going}+T\_{returning}=Total Time$$

 Gerry just returned from a cross country trip. The trip was 3000 miles from his home and his total time in the airplane for the round trip was 11 hours. If the plane was flying at a rate of 550 miles per hour, what was the speed of the jet stream?