# TOPIC 12-4 Independent Practice and Applications

1. Find the general solution of each equation and check your solution(s).

1. 

2. 

3. 

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5. 

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8. 

1. Real World Applications.
2. In the Overview to this module, we learned that the air flow rate of our breathing, the periodic behavior of inhaling and exhaling oxygen, may be represented by the sine function. The typical human breathing cycle (one inhale and one exhale) occurs in 5 second intervals. The velocity of air flow during breathing, *V*, measured in liters per second, after *t* seconds, may be expressed by the function:   
   NOTE: Velocity of air flow is positive during inhaling and negative during exhaling.
   1. Create a table of values for 
   2. During the given interval, when are we inhaling at the rate of 0.2 liters/second?
   3. During the given interval, when are we exhaling at the rate of 0.35 liters/second?
3. When throwing an object, such as a football, the distance travelled by the object on two factors: the initial velocity of the object; and the angle above the horizontal at which the object is thrown. This relationship may be modeled by the following trigonometric function, where *D* is the distance travelled (in feet),  is the initial velocity (in feet per second), and  is the initial angle above the horizontal (in degrees):



* 1. Two students are throwing a football on the school’s practice field. They are standing 40 yards apart. If one student throws the football to the other at the initial velocity of 90 feet/second, at what angle must the football be thrown to travel the distance between the students?
  2. If the students increase the distance between them to 50 yards, and the initial angle determined in part (a), above, remains the same, what initial velocity is required for the football to travel the new distance?
  3. Do all of your solutions fit the problem? Why or why not?