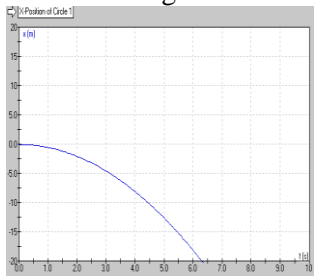
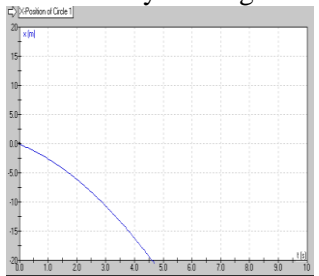
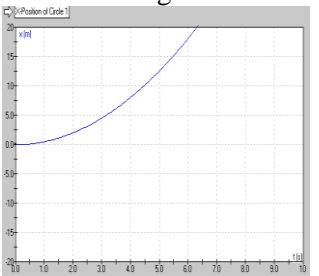
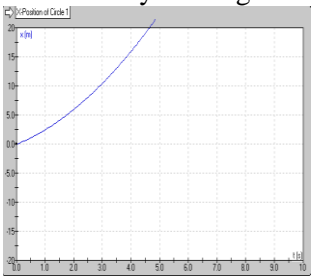
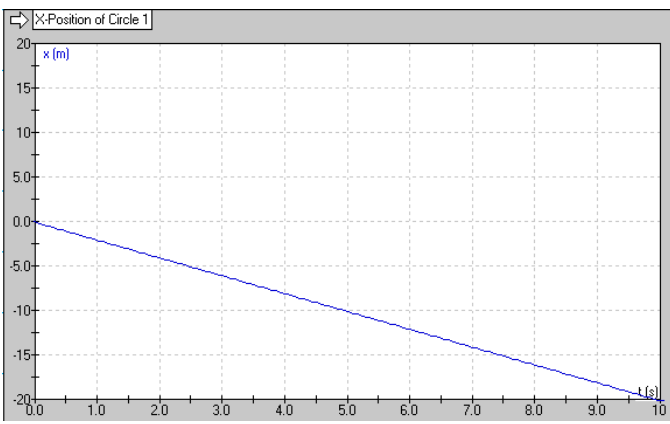
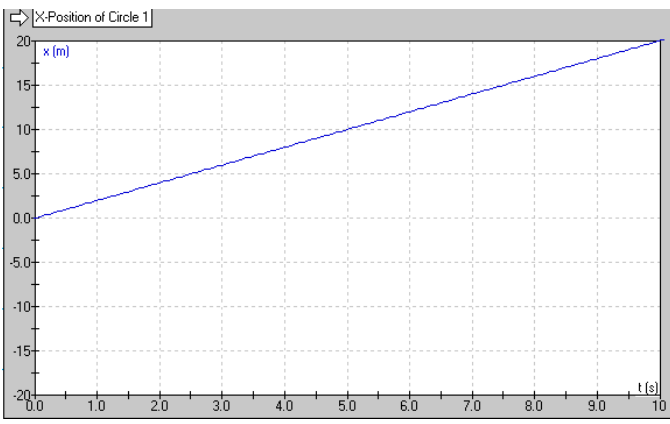
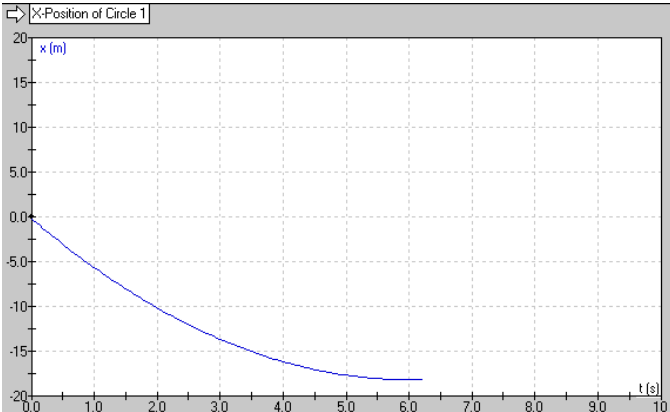
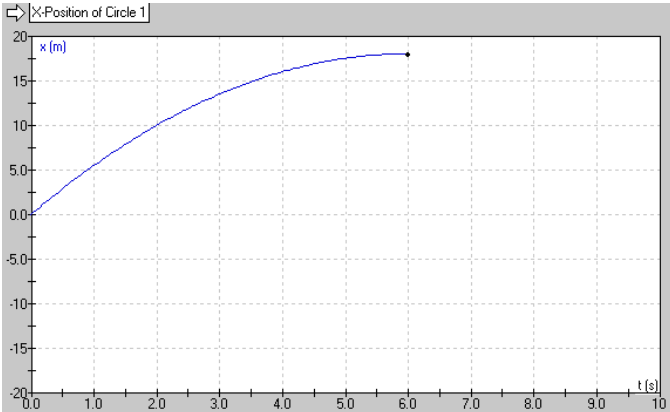
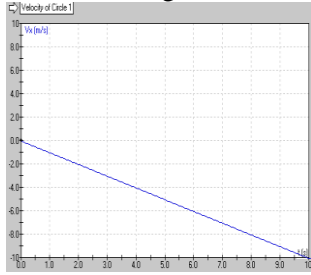
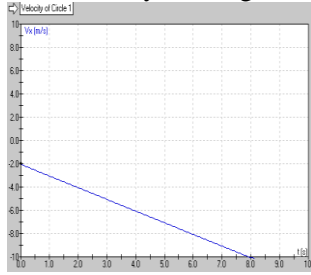
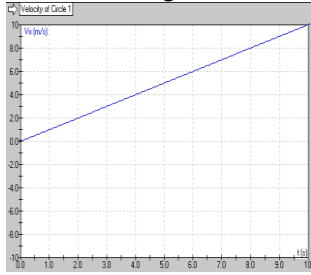
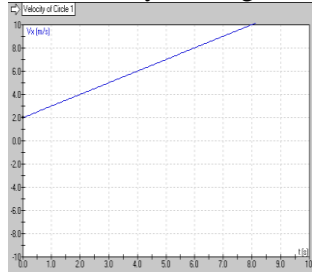
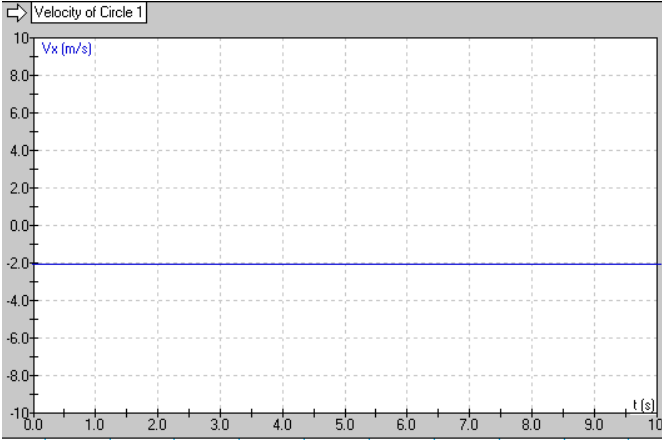
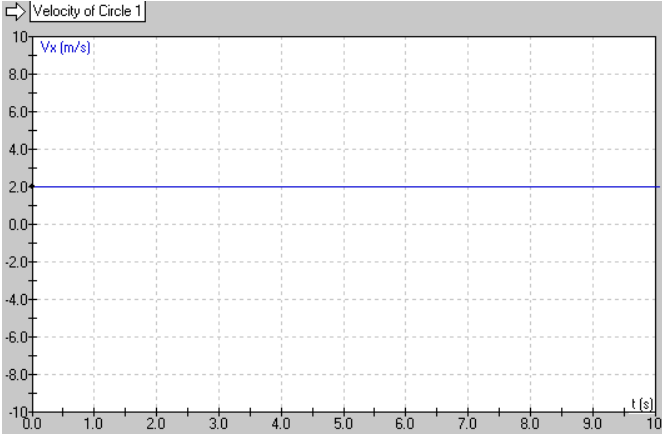
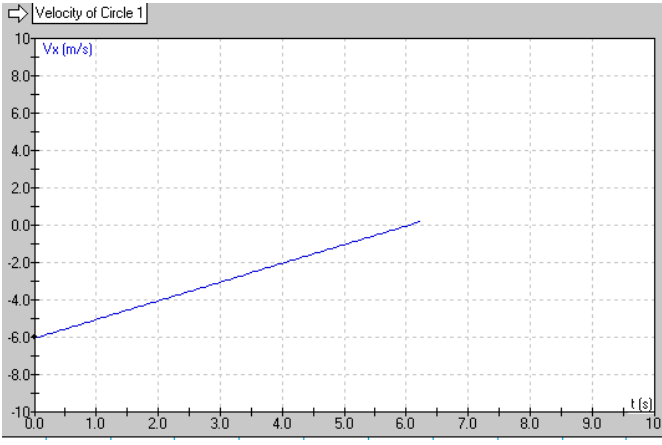
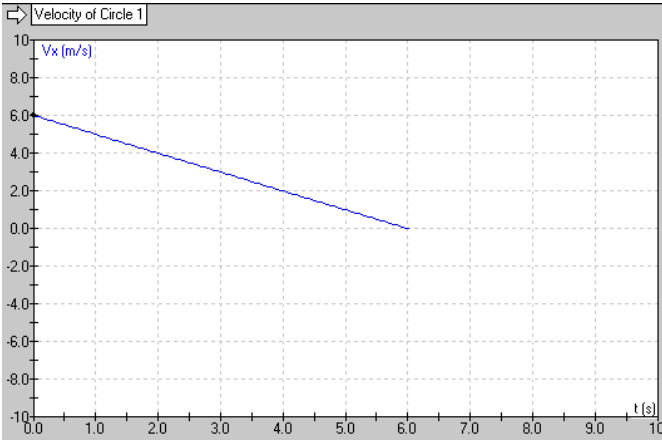


# Tobin's Spirit Guide to Graphs of Motion

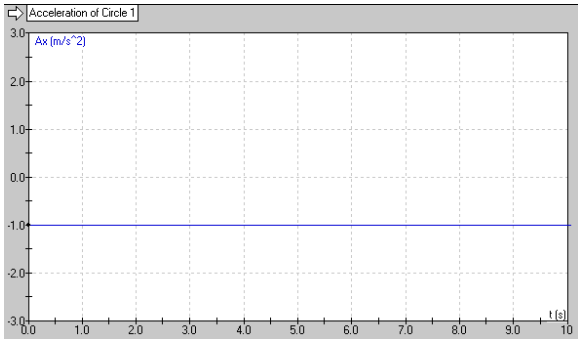
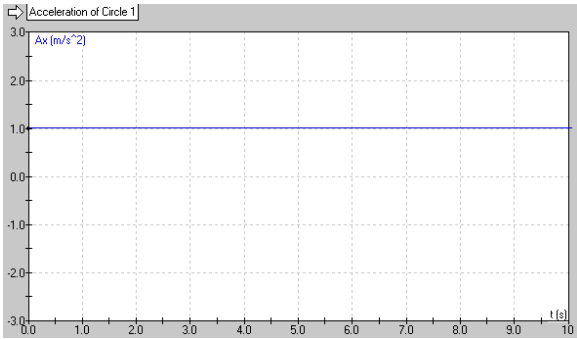
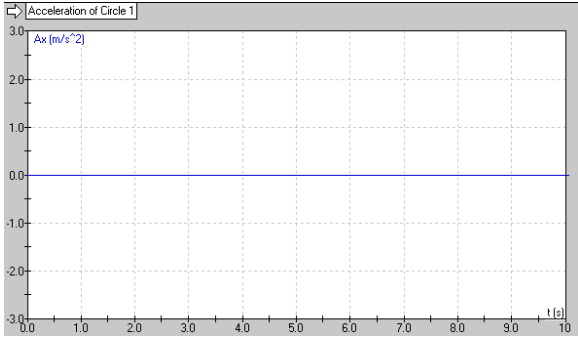
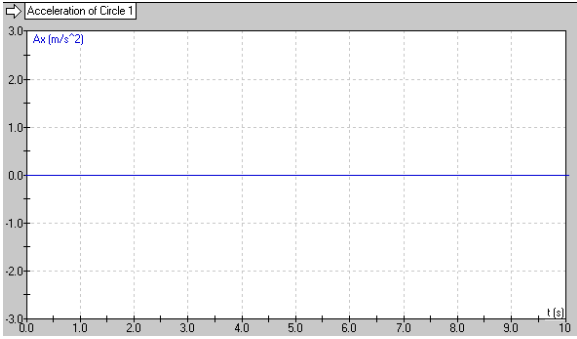
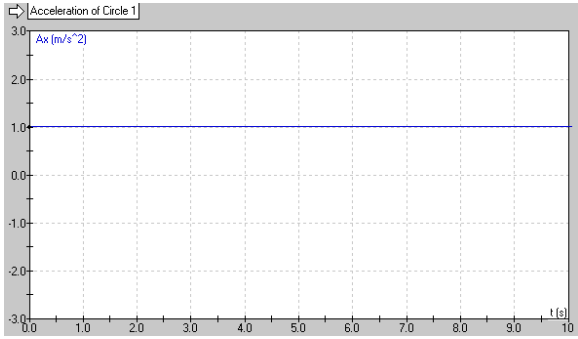
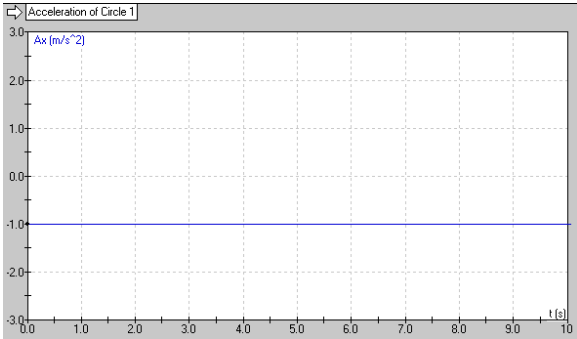
## Position Graphs:

|  | Moving to the Left (Negative Velocity)   | Moving to the Right (Positive Velocity)   |
|--|--|---|
| Speeding Up (Going faster and faster)  | <p>Negative velocity means negative slope. (The graph goes <u>down</u> as you move left to right) Speeding up means the graph gets steeper and steeper.</p>  | <p>Positive velocity means positive slope. (The graph goes <u>up</u> as you move left to right) Speeding up means the graph gets steeper and steeper.</p>   |
|  | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Accelerating from rest</p>  </div> <div style="text-align: center;"> <p>Already moving</p>  </div> </div> | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Accelerating from rest</p>  </div> <div style="text-align: center;"> <p>Already moving</p>  </div> </div> |
| Constant Velocity                      | <p>Negative velocity means negative slope. (The graph goes <u>down</u> as you move left to right) Constant speed means the slope doesn't change – it's a straight line.</p>  | <p>Positive velocity means positive slope. (The graph goes <u>up</u> as you move left to right) Constant speed means the slope doesn't change – it's a straight line.</p>   |
|  |    |    |
| Slowing Down (Going slower and slower) | <p>Negative velocity means negative slope. (The graph goes <u>down</u> as you move left to right) Slowing down means the graph gets less and less steep.</p>   | <p>Positive velocity means positive slope. (The graph goes <u>up</u> as you move left to right) Slowing down means the graph gets less and less steep.</p>  |
|  |   |   |

## Velocity Graphs:

|  | Moving to the Left (Negative Velocity)   | Moving to the Right (Positive Velocity)   |
|--|--|---|
| Speeding Up (Going faster and faster)  | <p>Moving to the left means the velocity is negative. Negative velocity graphs are all below zero. Speeding up means that as time goes on, the graph moves away from zero.</p>   | <p>Moving to the right means the velocity is positive. Positive velocity graphs are all above zero. Speeding up means that as time goes on, the graph moves away from zero.</p>   |
|  | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Accelerating from rest</p>  </div> <div style="text-align: center;"> <p>Already moving</p>  </div> </div> | <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Accelerating from rest</p>  </div> <div style="text-align: center;"> <p>Already moving</p>  </div> </div> |
| Constant Velocity                      | <p>Moving to the left means the velocity is negative. Negative velocity graphs are all below zero. Constant velocity means the graph doesn't move up or down – it's a horizontal line.</p>   | <p>Moving to the right means the velocity is positive. Positive velocity graphs are all above zero. Constant velocity means the graph doesn't move up or down – it's a horizontal line.</p>   |
|  |    |    |
| Slowing Down (Going slower and slower) | <p>Moving to the left means the velocity is negative. Negative velocity graphs are all below zero. Slowing down means that as time goes on, the graph moves toward zero.</p>   | <p>Moving to the right means the velocity is positive. Positive velocity graphs are all above zero. Slowing down means that as time goes on, the graph moves toward zero.</p>   |
|  |   |   |

## Acceleration Graphs:

|  | Moving to the Left (Negative Velocity)   | Moving to the Right (Positive Velocity)   |
|--|--|---|
| Speeding Up (Going faster and faster)  | <p>In order to speed up, the acceleration and the velocity must be in the same direction. If it is moving <u>left</u> and going faster and faster, the acceleration must also be to the <u>left</u>, and therefore <u>negative</u>.</p>           | <p>In order to speed up, the acceleration and the velocity must be in the same direction. If it is moving <u>right</u> and going faster and faster, the acceleration must also be to the <u>right</u>, and therefore <u>positive</u>.</p>         |
| Constant Velocity                      | <p>If the velocity is constant, the acceleration is <u>zero</u>, regardless which way it is moving.</p>    | <p>If the velocity is constant, the acceleration is <u>zero</u>, regardless which way it is moving.</p>    |
| Slowing Down (Going slower and slower) | <p>In order to slow down, the acceleration and the velocity must be in the opposite directions. If it is moving <u>left</u> and going slower and slower, the acceleration then must be to the <u>right</u>, and therefore <u>positive</u>.</p>  | <p>In order to slow down, the acceleration and the velocity must be in the opposite directions. If it is moving <u>right</u> and going slower and slower, the acceleration then must be to the <u>left</u>, and therefore <u>negative</u>.</p>  |