# March 2, Week 7

Today: Finish Chapter 5 (Finally!)

Homework #5, Due March 5.
Mastering Physics: 10 problems from chapters 4 and 5
Written Question: 5.74

If interested in Physics 110, please see me after lecture.

Exam 3, Next Friday, March 9
Practice Exam now available on website

# Circular Dynamics

Objects in circular motion must have an inwards acceleration in order to change direction.

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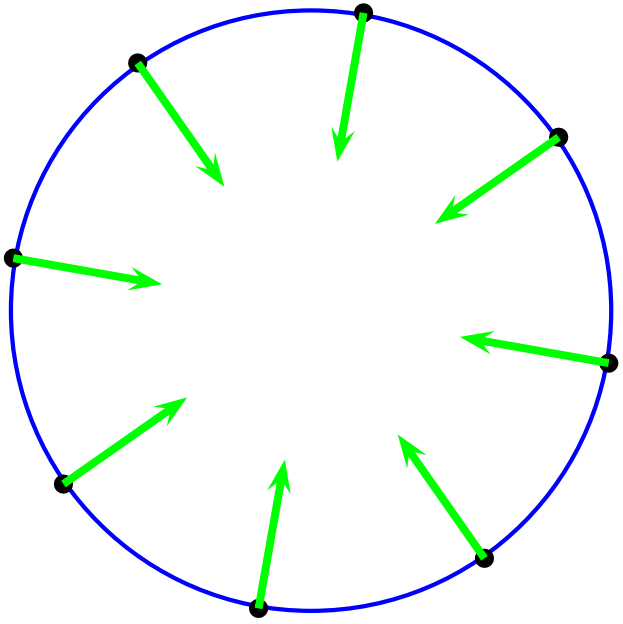

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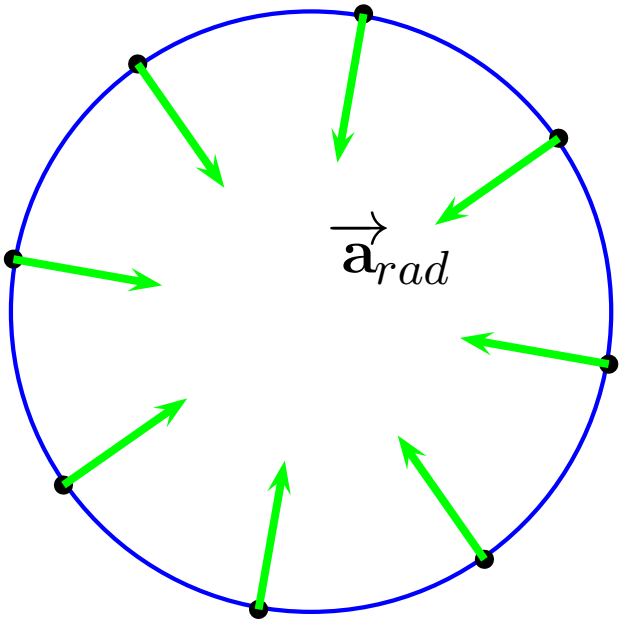


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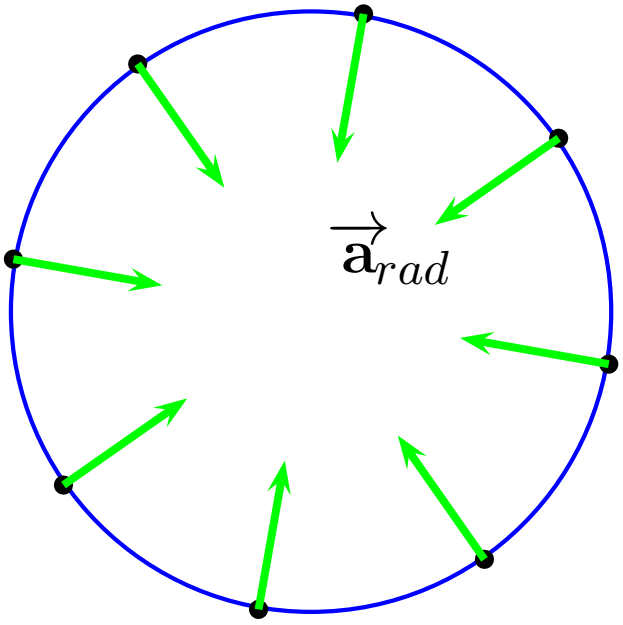


$$a_{rad} = \frac{v^2}{r}$$

$\overrightarrow{\mathbf{a}}_{rad}$, like any other acceleration is **NOT** put on free body diagrams. It is created by other forces like weight, tension, normal, *etc.*

# Example I

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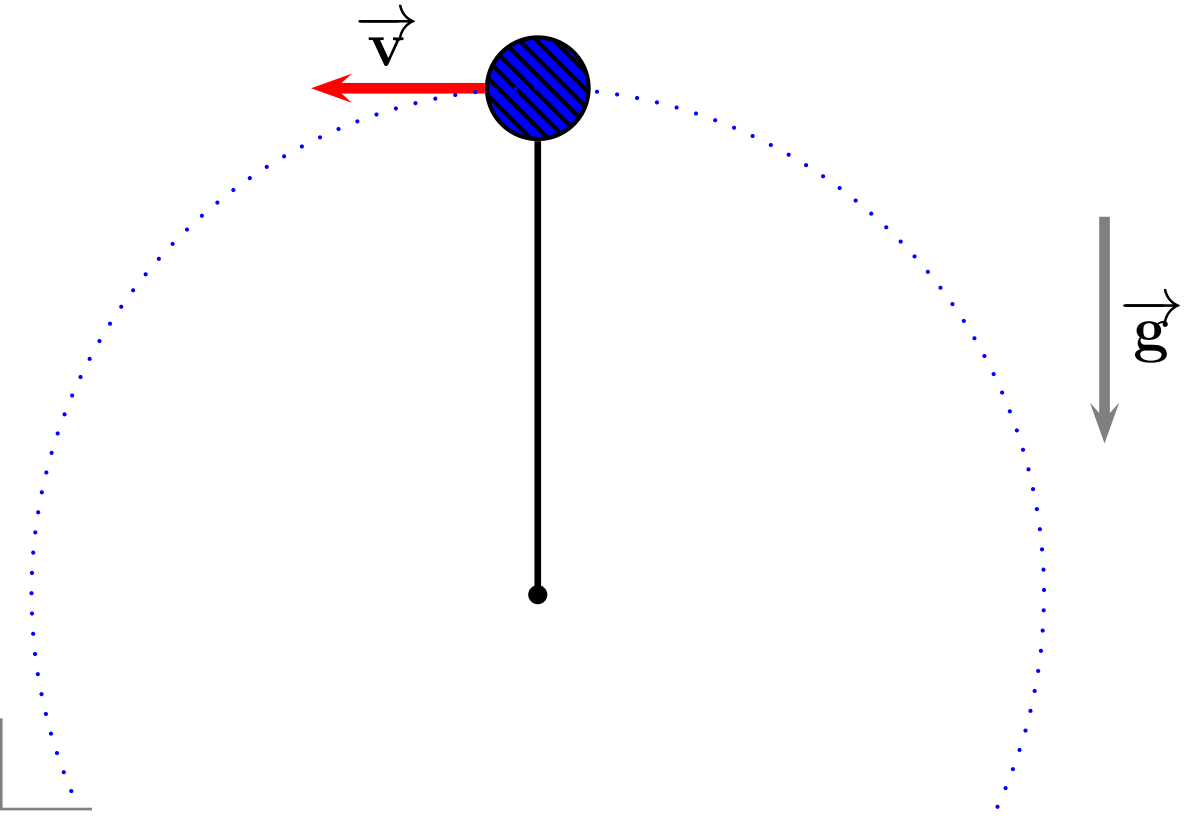
- The man rides into a $10-m$ radius half-pipe. If he maintains a constant $15\,m/s$ speed, what is his apparent weight at the bottom of the half-pipe?

# Clicker Quiz

A ball, attached to a massless string, is swung in a vertical circle. At the top of the circle, which of the following is a true statement about the string's tension?



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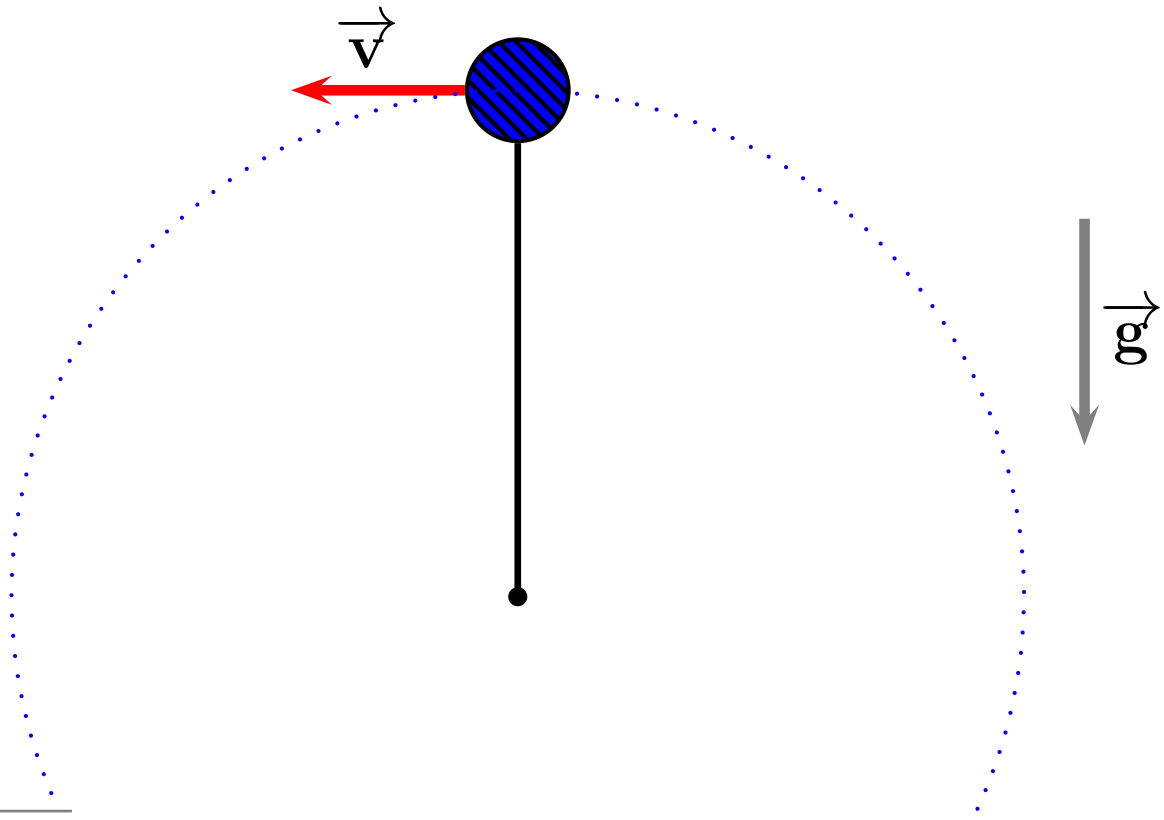


(a) $|T| = Mg$

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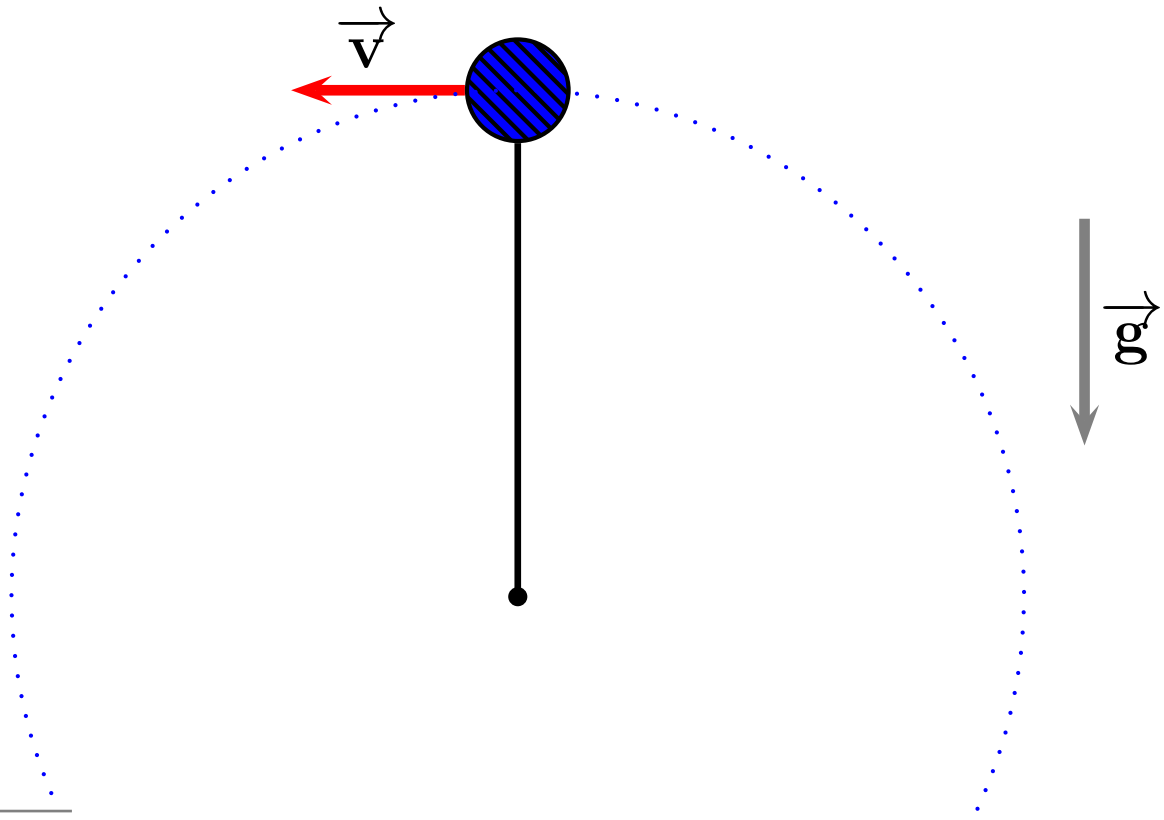


(a) $|T| = Mg$

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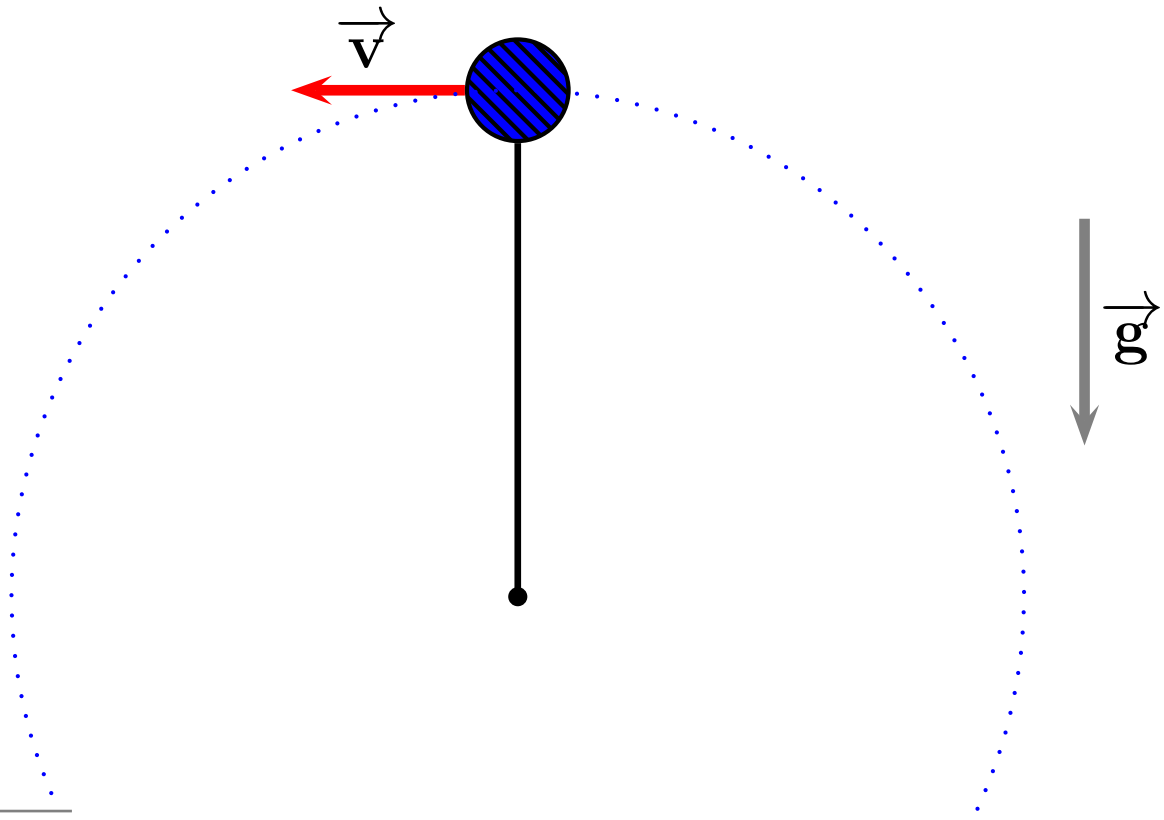


(a) $|T| = Mg$

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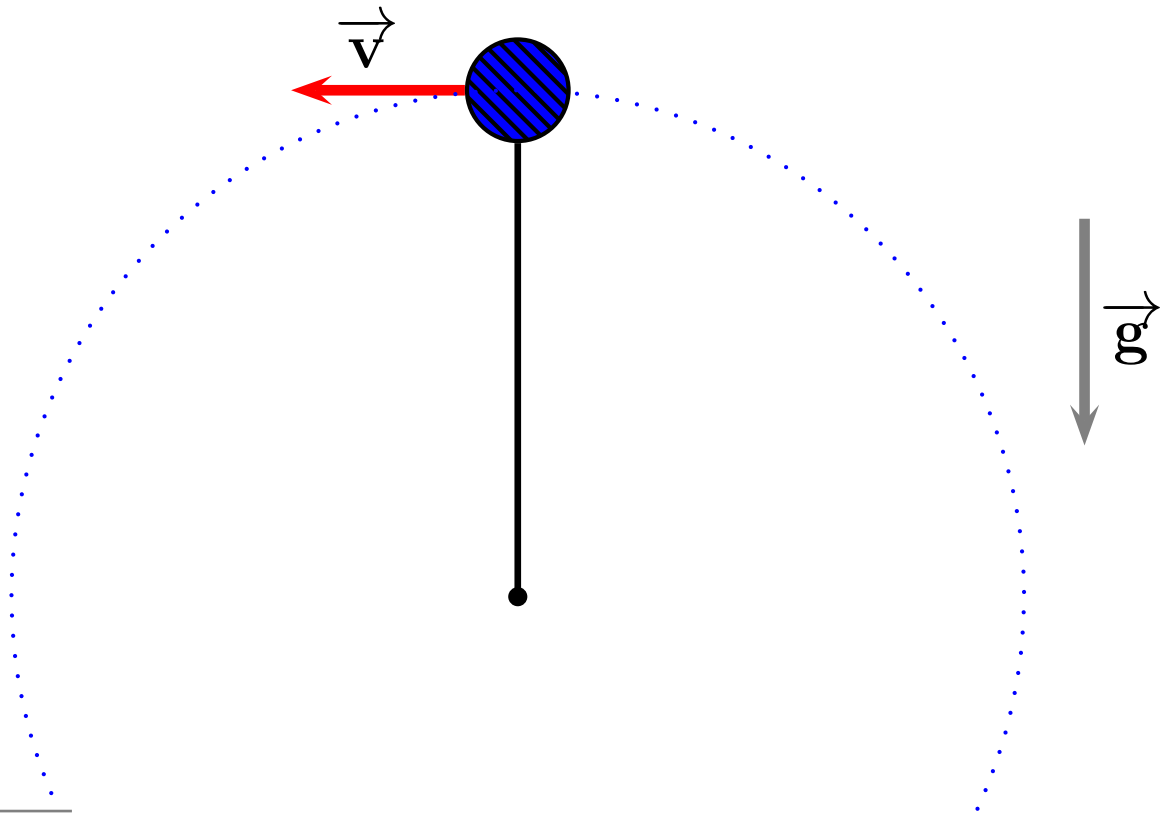


(a) $|T| = Mg$

**(b) $|T| < Mg$**

(c) $|T| > Mg$

# Example II

A $2\,kg$ ball, attached to a massless string, is swung in a vertical circle of radius $0.4\,m$. If at the instant shown, the ball has a speed of $2.5\,m/s$, what is the tension in the string and the ball's acceleration?