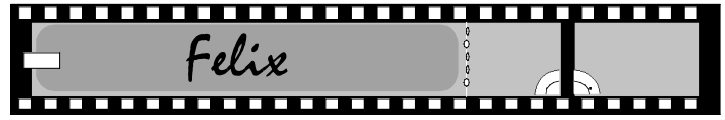


# PHYZVIDEO SPRINGBOARD: UNIFORM CIRCULAR MOTION



## MOVING IN CIRCLES

1. What is a circle?

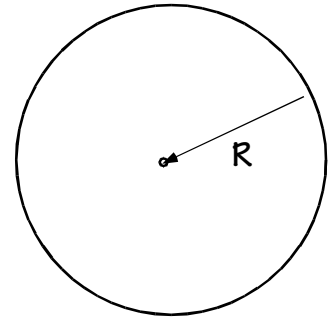
*A set of points on a plane equidistant from a given fixed point, the center.*

2. a. What is the circle's special distance called?

*Radius*

b. What symbol is used to represent it? *r or R*

c. What SI units are used when measuring it? *meters (m)*



3. What must be true about the orbital radius of a body in uniform **circular** motion?

*It is constant.*

4. Which of the following statements is true?

A body in **uniform** circular motion maintains constant speed.

A body in **uniform** circular motion maintains constant velocity.

A body in **uniform** circular motion maintains constant speed and velocity.

5. How could the speed of a body in uniform circular motion be measured or calculated using a meterstick and a stopwatch?

*Since  $v = d/t$  and*

*$d = 2R$  (circumference of the circle) and*

*$t = T$  (period of the orbit),*

*$v = 2R / T$*

*(Measure R with meterstick and T with stopwatch.)*

6. Which of the following statements is true?

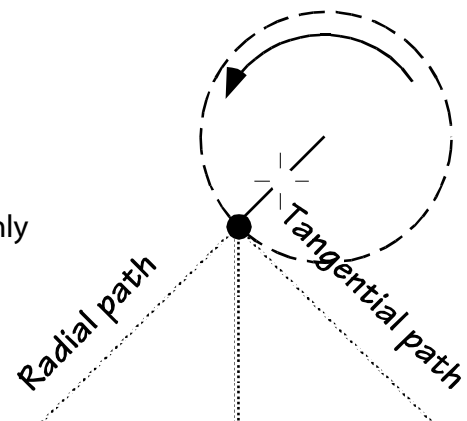
A body in uniform circular motion is accelerating.

A body in uniform circular motion is not accelerating.

## PLEASE RELEASE ME, LET ME GO

7. Suppose a body (such as Odie™) is being swung in circular motion (in a zero-gravity environment) when the cord is suddenly released (or breaks). Describe the subsequent path of the body.

*Answers will vary.*



8. View the preliminary segment of *Physics: Cinema Classics* B-26.

a. Prediction. What path will the puck follow when the string breaks?

*Answers will vary.*

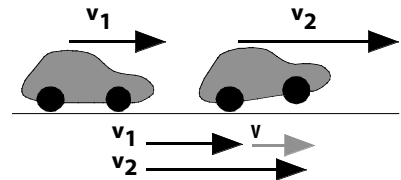
b. Observation. View the outcomes of the several trials shown in subsequent segments of *P:CC* B-26. What path did the puck follow when the string broke?

*The tangential path.*

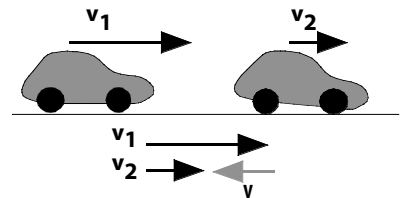
**ACCELERATION WITH CONSTANT SPEED?**

9. What is the **direction** of the change in velocity of

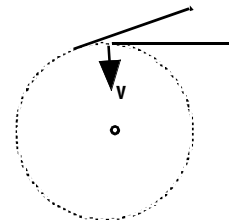
a. a car that's speeding up? (Draw the velocity vectors and determine the difference between them using  $\mathbf{v}_1 + \mathbf{v} = \mathbf{v}_2$ .)



b. a car that's slowing down? (Draw the velocity vectors and determine the difference between them using  $\mathbf{v}_1 + \mathbf{v} = \mathbf{v}_2$ .)



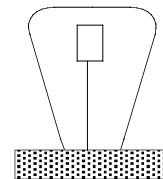
c. a body in circular motion? (Step through the graphical derivation within *P:CC* B-26.)



10. Considering your answers to question 9, what is the direction of acceleration of a body in uniform circular motion?

*Toward the center of the circle.*

11. A cork is suspended from the bottom of an inverted, water-filled jar. The cork acts as an acceleration indicator. The cork moves \_\_\_ in the direction of the acceleration of the jar. \_\_\_ opposite to the direction of the acceleration of the jar.



a. Prediction. Where will the cork move when the puck is set into circular motion?

*Answers will vary.*

b. Observation. Where did the cork move when the puck was set into circular motion? Does this verify your answer to question 10?

*Toward the center of the circle.*

