# Algebra-based Physics-1: Mechanics (PHYS135A-01): Week 7

Jordan Hanson

October 16th - October 20th, 2017

Whittier College Department of Physics and Astronomy

# WEEK 6 REVIEW

# Week 6 Review

1. Angular kinematics and dynamics
    - Angular displacement
    - Angular velocity
    - Centripetal acceleration
2. Newton's Law of Gravity and circular orbits
3. Kepler's Laws

# WEEK 6 REVIEW PROBLEM

# WEEK 6 REVIEW PROBLEM

On the game show Wheel of Fortune, a large wheel is divided into sections worth varying dollar amounts. Contestants try to spin the wheel such that they get the good ones. Player 1 notices that the $10,000 marker is on the opposite side (180 degrees away). What is this angle in radians? If she has great luck and spins such that the wheel turns exactly 180 degrees, in 2 seconds, what is the angular speed in radians per second?

- A: $\pi/2$ radians, $\pi/4$ radians per second
- B: 0 radians, 0 radians per second
- C: $\pi$, $\pi/2$ radians per second
- D: $\pi$, $\pi/4$ radians per second

# WEEK 6 REVIEW PROBLEM

Astronomers are observing two planets orbiting a star for several months. They observe that planet 1 orbits twice as fast as planet 2. If the orbital radius of planet 1 is 1 AU, what is the orbital radius of planet 2, in AU?

- A: 1 AU
- B: 1.6 AU
- C: 4 AU
- D: 3.2 AU

# WEEK 7 SUMMARY

# WEEK 7 SUMMARY

1. Work has a scientifically precise definition
    - Units
    - As a product of force and displacement vectors
2. Kinetic Energy and the Work-Energy Theorem
3. Gravitational potential energy
    - Potential energy
    - *Simplifying otherwise complex calculations*
    - Potential energy near Earth's surface
    - ...in space
4. Definition of a **conservative force**
    - Relationship between conservative forces and potential energy
    - Conservation of energy for conservative forces

# CONCLUSION

# WEEK 7 SUMMARY

1. Work has a scientifically precise definition
    - Units
    - As a product of force and displacement vectors
2. Kinetic Energy and the Work-Energy Theorem
3. Gravitational potential energy
    - Potential energy
    - *Simplifying otherwise complex calculations*
    - Potential energy near Earth's surface
    - ...in space
4. Definition of a **conservative force**
    - Relationship between conservative forces and potential energy
    - Conservation of energy for conservative forces

# ANSWERS

# ANSWERS

- $\pi$, $\pi/2$ radians per second
- 1.6 AU
- ...