

**IMPORTANT TERMS:**

- Period
- Ellipse
- Escape speed
- Satellite
- Orbital Speed

**EQUATIONS:**

# UNIT I: MECHANICS

## Chapter 14: Satellite Motion

### I. Earth Satellites (14.1)

A. **Earth Satellite**— a projectile that \_\_\_\_\_ around Earth rather than into it.

1. A dropped object will fall **\_\_\_ meters in one second**
2. The curvature of Earth drops vertical distance of **5 meters every \_\_\_\_\_ meters** tangent to its surface

B. **Orbital speed** of object (close to Earth) will be \_\_\_\_\_

### II. Circular Orbits (14.2)

A. In a circular orbit the speed of a circling satellite is \_\_\_\_\_ changed by gravity

1. Gravity is neither pulling forward nor backward
2. Gravity is acting (Pulling) \_\_\_\_\_ to the motion



B. **Period**— Time it takes to make one \_\_\_\_\_ of Earth

1. Satellite near Earth = about \_\_\_\_\_
2. Moon = \_\_\_\_\_ days (further away from Earth)

### III. Elliptical Orbits (14.3)

A. A projectile just above atmosphere at horizontal speed more somewhat more than 8 km/s will overshoot circular path and trace out an oval-shaped path (an \_\_\_\_\_)

B. Satellite speed varies in an elliptical orbit

1. Near Earth \_\_\_\_\_
2. \_\_\_\_\_ down as moves away because gravity acting on it (motion no longer \_\_\_\_\_ to force of gravity)

### IV. Energy Conservation and Satellite Motion (14.4)

A. An object in orbit (moving) has both \_\_\_\_\_ and \_\_\_\_\_ **energy**

1. **Sum of KE and PE everywhere is \_\_\_\_\_**
2. Circular orbit— PE is \_\_\_\_\_. Means also that

KE must also remain the same (law of conservation of energy)

3. Elliptical orbit– both \_\_\_\_\_ and \_\_\_\_\_ vary

a. **PE greatest** when \_\_\_\_\_ away and **KE will be least**

b. **PE least** when \_\_\_\_\_ and **KE greatest**

c. Sum of **KE** and **PE** always \_\_\_\_\_

#### V. Escape Speed (14.5)

A. escape speed from Earth = \_\_\_\_\_

1. This neglects \_\_\_\_\_

2. Once above air resistance, load must be launched horizontally at \_\_\_\_\_ to orbit

B. Escape velocities vary on other planets (differing \_\_\_\_\_ forces)

