

Definitions:

Acceleration (41, 67, 68, RSIII)

Projectile (70, 72)

Centrifugal (69)

Radial (69)

Centripetal (67, 69)

Simple Trajectory (70, 72)

Instantaneous acceleration (68, 68c)

Tangential (79, 70)

Orbit (68)

Trajectory (70, 72)

Parabola (16)

Discoveries

- How can the speed of a uniform circular motion be determined from its orbit radius and period? (68)
- If an object is moving along a curved path with *increasing* speed then the angle between its acceleration and its velocity (when drawn tail-to-tail) must be _____ than ____ degrees. (42, 71)
If an object is moving along a curved path with *decreasing* speed then the angle between its acceleration and its velocity (when drawn tail-to-tail) must be _____ than ____ degrees.
- If an object is moving along a curved path with *constant* speed, (i.e. with uniform circular motion) then its acceleration is in the _____ direction. (41, 67, 71) How can we predict the magnitude of that acceleration? (69, 73)
 - In terms of period and orbit radius: $a = \underline{\hspace{2cm}}$
 - In terms of speed and orbit radius: $a = \underline{\hspace{2cm}}$
 - In terms of speed and period: $a = \underline{\hspace{2cm}}$
- How can any centripetal acceleration formula be transformed into a centripetal force formula? (68)
- The resulting centripetal force formulas say: $F = \underline{\hspace{2cm}}$, or $F = \underline{\hspace{2cm}}$, or $F = \underline{\hspace{2cm}}$.
- What important restrictions or clarifications are necessary for such centripetal force formulas? (69)
- How can an orbital speed be determined from orbit radius and centripetal acceleration? (69)
- How fast must you drive to put a car into orbit? (#2 on p. 73)
- What do we know about the motion of a projectile in a simple trajectory? (70, 72)
 - First trajectory principle: The horizontal component of its _____ is constant.
 - Second principle: The vertical component of its _____ is constant because the acceleration caused by gravity _____ (does, does not) depend on horizontal velocity.
- What is the shape of a simple trajectory? (70) _____
- Horizontal Range Formula: (73)
- The trajectory of a real projectile differs from a "simple" trajectory because it is influenced by a "_____" force in addition to gravity. (56)
 - The direction of that force is _____ to the _____ of the projectile.
 - How does the magnitude of that force depend on the object's speed? (#11 on RS V)
- What approximations are helpful in problems involving small angles if radian measure is used?
 $\sin\theta = \underline{\hspace{2cm}}$ $\tan\theta = \underline{\hspace{2cm}}$ $\cos\theta = \underline{\hspace{2cm}}$ (68b)
- How can we estimate the uncertainty of an average of N repeated measurements if each individual measurement has a known uncertainty due to random errors? (69b)