12.7: Exploding Projectiles and Other Considerations

Exploding Projectiles

If a projectile explodes in mid-air, the force from the explosion will cause the various fragments of the original body to follow new trajectories—each of which will be a segment of a new parabola. However, *the center of mass of the fragments will continue along the original parabolic trajectory*. (The center of mass is discussed in Chapter 31.)

Other Considerations

In our study of projectile motion, we have made a number of approximations:

1. We have assumed the acceleration due to gravity is a constant, so we've ignored the curvature of the Earth. If a projectile travels a long distances, then it would be important to take this into account, and treat the motion as an ellipse.
2. We have assumed the projectile is in a vacuum—we did not account for air resistance. The results we've derived will be approximately correct, but to get answers that match reality more closely we would need to allow for the effects of air resistance (Chapter 19).
3. We have not allowed for the effects of wind. If a wind is blowing, it will alter the course of the projectile.
4. If the projectile travels a long distance, then we would need to allow for the rotation of the Earth by accounting for the Coriolis force (Chapter 43).