11.5 Force, Work, and Potential Energy

11.6 Finding Force from Potential Energy

15. A particle moves in a vertical plane along a *closed* path, starting at A and eventually returning to its starting point. How much work is done on the particle by gravity? Explain.

16. a. If the force on a particle at some point in space is zero, must its potential energy also be zero at that point? Explain.

b. If the potential energy of a particle at some point in space is zero, must the force on it also be zero at that point? Explain.

17. The graph shows the potential-energy curve of a particle moving along the $x$-axis under the influence of a conservative force.

a. In which intervals of $x$ is the force on the particle to the right?

b. In which intervals of $x$ is the force on the particle to the left?

c. At what value or values of $x$ is the magnitude of the force a maximum?
d. What value or values of $x$ are positions of stable equilibrium?

e. What value or values of $x$ are positions of unstable equilibrium?

f. If the particle is released from rest at $x = 0$ m, will it reach $x = 10$ m? Explain.

### 11.7 Thermal Energy

18. A car traveling at 60 mph slams on its brakes and skids to a halt. What happened to the kinetic energy the car had just before stopping?

19. What energy transformations occur as a skier glides down a gentle slope at constant speed?