6. This problem differs from the second one in that it has a non-zero value for the initial velocity. We use the same equation as was used in the second problem with a positive value for the initial velocity.

$$d = v_o\ t + (1/2)\, a\, t^2$$

$$d = (5 m/s)(2 s) + (1/2)(-9.8 m/s^2)(2 s)^2$$

$$d = 10 m - 19.6 m = -9.6 m$$

Note the negative sign indicating that the displacement is downward, i.e. the rock is located 9.6 m below the starting point. Even though the initial velocity was in the positive, upward direction the object was in the air long enough to reach the peak of its travel, pass back through the starting point, and to be below the starting point. To check your understanding you might repeat this problem using an initial velocity of 25 m/s to obtain a displacement of + 30.4 m or 30.4 m upward.