1. You have invested $1,000 at a nominal rate of 9%.

(2) a. What will be the nominal value of your investment after 25 years?

(3) b. If inflation averages 3% over the next 25 years, what will the real value of your investment be after 25 years?

(3) c. What will be the real rate of return on your investment?

2. You have had a successful forestry career and wish to endow the Penn State School of Forest Resources with a fund that will yield a real value of $5,000 annually, forever, for scholarships. The fund is expected to earn a nominal rate of 8%, and inflation is expected to average 3.5%.

(3) a. What real rate of return is the fund expected to earn?

(3) b. How much money will you need to place in the fund to ensure that a real value of $5,000 can be withdrawn each year?

3. In the first quarter of 1992, northern red oak stumpage in southwestern Pennsylvania sold for an average price of $282/mbf. In the first quarter of 2003, the average northern red oak stumpage price in the region was $476/mbf. The PPI for all finished goods for the first quarter of 1992 was 122.0, and for the first quarter of 2003 it was 142.4.

(3) a. What was the average rate of inflation for lumber and wood products over this period?

(3) b. What was the nominal rate of change in northern red oak stumpage prices in the region over this period?

(3) c. What was the real rate of change in northern red oak stumpage prices (relative to all finished goods) in the region over this period?

(2EC) d. What will the nominal northern red oak stumpage prices be in 2020 if these trends continue?

(2EC) e. What will the real northern red oak stumpage prices be in 2020 if these trends continue?

4. A woman has just inherited 20 acres of forestland. She doesn’t really want to keep the land, and the real estate broker she talked to said she would get the most money by clearcutting the timber first and then selling the bare land. She hired a forester who estimated that her current inventory is 8 mbf/ac of good oak timber, which, at the going rate of $476/mbf, should earn her $3,808 per acre. A developer is interested in the land, and has offered to pay $900/ac for the cleared land. The forester suggested that she hold onto the land, and he estimates that in ten years the stand volume should increase to 12 mbf/ac (a 50% increase over ten years).

(4) a. Assume constant real prices for both land and timber. If the woman’s real alternate rate of return is 6%, should she wait to sell the timber and the land?

(4) b. Assume that oak sawtimber prices will increase at a real rate of 3% per year and that the bare land value will increase at a real rate of 5%. Under these assumptions, should the woman wait to sell the timber and land?