4. See Quick Check Problem #2-7.

6. As the years to maturity parameter increases, the yield increases, so the yield curve is upward-sloping in this region.

7. For each 1-year increase in years to maturity, the slope of the yield curve behaves as follows:

<table>
<thead>
<tr>
<th>Change in Years to Maturity</th>
<th>Slope of Yield Curve</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year to 2 years</td>
<td>$3.01 - 2.67 = 0.34$</td>
</tr>
<tr>
<td>2 years to 3 years</td>
<td>$3.55 - 3.01 - 0.54$</td>
</tr>
<tr>
<td>3 years to 4 years</td>
<td>$4.33 - 3.55 = 0.78$</td>
</tr>
</tbody>
</table>

So, the slope of the yield curve increases.

8. The dividend income component is defined as:

$$\text{Dividend Income Component} = \frac{\text{Cash Dividend}}{\text{Beginning Price}}$$

So, for this problem we have:

$$\text{Dividend Income Component} = \frac{7}{87.50} = 0.08 \text{ (or 8%)}$$

9. The one-year rate of return, $r$, is given by:

$$r = \frac{\text{Ending Price of a Share} - \text{Beginning Price} + \text{Cash Dividend}}{\text{Beginning Price}}$$

So, for this problem we have:

$$r = \frac{(50 - 87.50) + 7}{87.50} = \frac{50.50 - 87.50}{87.50} = -0.3486 \text{ (or -34.86%)}$$

10. At the current exchange rate, to purchase the $1000 U.S. government bond the British investor needs 750 French Francs (since the current exchange rate is 0.75 British pounds per U.S. Dollar). In one year, the investor receives 1070 U.S. Dollars (since the interest rate on the $1000 U.S. government bond is 7%). To compute the realized British pound rate of return on this bond, this U.S. dollar sum must be converted to British pounds. Since the exchange rate one year from now is assumed to be 0.90 British pounds per U.S. Dollar, 1070 U.S. Dollars one year from now will be worth 963 British pounds. Thus, the realized one-year British pound rate of return to holding the U.S. government bond is:

$$\text{British Pound Rate of Return} = \frac{963 - 750}{750} = 0.284 \text{ (or 28.4%)}$$

11. We first need to compute the $FV$. For this problem we have: $PV = 550$, $i = 5\%$, and $n = 7$. Recalling that:

$$FV = PV(1 + i)^n,$$
we have:

\[ FV = 550(1 + 0.05)^7 = 773.91 \]

The total interest earned is this \( FV \) of $773.91 minus the \( PV \) of $550, i.e., $223.91. Next, the simple interest earned per year is given by \( 0.05 \times 550 = 27.50 \). Over a period of seven years, the total simple interest earned, then, is \( 7 \times 27.50 = 192.50 \). So, since the compound interest earned is equal to the total interest minus the simple interest, we have:

\[
\text{Compound Interest} = 223.91 - 192.50 = 31.41.
\]

12. To answer this problem, we need to compute the present value of an ordinary annuity. Recall that for an ordinary annuity which makes an annual payment equal to \( PMT \) for \( n \) years, the \( PV \), computed using the interest rate \( i \) as the discount rate, is given by:

\[
PV = \frac{1 - (1+i)^{-n}}{i} \times PMT,
\]

which gives us:

\[
PV = \frac{1 - (1.06)^{-20}}{0.06} \times 150,000 = 1,720,488.18
\]

13. With weekly compounding, \( PV = 1,000, i = 5.2\%, n = 1 \) year = 52 weeks, we have:

\[
FV = 1,000 \times (1 + (0.052/52))^{52} = 1,000 \times (1.001)^{52} = 1053.35
\]

14. With \( i = 6.25\% \) and \( n = 12 \):

\[
EFF = (1 + (\frac{i}{n}))^n - 1 = (1 + (0.0625/12))^{12} = 1.0643 \text{ (or } 6.43\%\text{)}
\]

15. To compute the bond’s yield to maturity, we need to solve for \( i \) as follows:

\[
600 = 75 \times (1 + i)^{25} \Rightarrow (1 + i)^{25} = 8 \Rightarrow 1 + i = 8^{0.04} \Rightarrow i = 0.0867 \text{ (or } 8.67\%\text{)}
\]

16. To compute the \( NPV \), we first need to compute the \( PV \) of the bond using a market capitalization rate of 7.67%:

\[
PV = \frac{600}{1.0767^{25}} = 94.58
\]

Then, the \( NPV \) is given by the difference between the \( PV \) of the bond and its price:

\[
NPV = 94.58 - 75 = 19.58
\]

17. In Problem #15, we saw that the bond’s internal rate of return is 8.67%. Since this is higher than the opportunity cost of capital (i.e., the 7.67% that can be earned on funds in the bank account described in Problem #16), the rate of return decision implies that an investor should prefer purchasing the bond.

18. This requires computing the \( PV \) of a level perpetuity. Recall that:

\[
PV \text{ of a level perpetuity} = \frac{C}{i}, \text{ where}
\]

\[ C = \text{constant/level payment and } i = \text{interest}. \] So, in this problem we have:
PV of the described cash flow = \( \frac{500}{0.05} \) = $10,000

19. We need to compute the FV of an ordinary annuity with \( PMT = $125 \), \( i = 0.08 \), and \( n = 15 \):

\[
FV = \frac{(1+i)^n-1}{i} \times PMT = \frac{(1.08)^{15}-1}{0.08} \times 125 = 3,394.01
\]

20. With the same annual percentage rate, higher frequency of compounding leads to a higher effective annual rate.

21. You could invest $1 today in dollar-denominated bonds and have $1.05 one year from now. Or you could convert the dollar today into 0.5 British pounds (BP) (an exchange rate of $2.00 per BP implies that $1 is worth 0.5 BP) and invest in BP-denominated bonds to have 0.53 BP one year from now. For you to break even, the 0.53 BP would have to be worth $1.05 one year from now. So the break-even exchange rate is:

\[
\frac{$1.05}{0.53 \text{ BP}}, \text{ or } $1.9811 \text{ per BP}.
\]

22. You could take the $900 out of your bank account and pay down your credit card balance by this amount. You would give up 3\% in interest earnings ($27 per year) but you would save 19\% per year in interest expenses on this $900 ($171 per year). So the arbitrage opportunity is worth $171 - $27 = $144 per year.

23. $80 buys the same amount of gold (1 ounce) as 30 BP, so 1 BP is worth $80/30, or $2.67.

24. The estimated value is:

\[
$135 (EPS \text{ of } $15 \times P/E \text{ ratio of } 9)
\]