**1.** The portfolio weight of an asset is the total investment in that asset divided by the total portfolio value. First, we will find the portfolio value, which is:

Total value = 145($45) + 110($27) = $9,495

The portfolio weight for each stock is:

WeightA = 145($45)/$9,495 = .6872

WeightB = 110($27)/$9,495 = .3128

**2.** The expected return of a portfolio is the sum of the weight of each asset times the expected return of each asset. The total value of the portfolio is:

Total value = $2,950 + 3,700 = $6,650

So, the expected return of this portfolio is:

E(*RP*) = ($2,950/$6,650)(0.08) + ($3,700/$6,650)(0.11) = .0967, or 9.67%

**3.** The expected return of a portfolio is the sum of the weight of each asset times the expected return of each asset. So, the expected return of the portfolio is:

E(*RP*) = .35(.09) + .20(.17) + .45(.13) = .1240, or 12.40%

**4.** Here we are given the expected return of the portfolio and the expected return of each asset in the portfolio and are asked to find the weight of each asset. We can use the equation for the expected return of a portfolio to solve this problem. Since the total weight of a portfolio must equal 1 (100%), the weight of Stock Y must be one minus the weight of Stock X. Mathematically speaking, this means:

E(*RP*) = .111 = .12*wX* + .095(1 – *wX*)

We can now solve this equation for the weight of Stock X as:

.111 = .12*wX* + .095 – .095*wX*

.016 = .025*wX*

*wX* = 0.64000

So, the dollar amount invested in Stock X is the weight of Stock X times the total portfolio value, or:

Investment in X = 0.64000($10,000) = $6,400

And the dollar amount invested in Stock Y is:

Investment in Y = (1 – 0.64000)($10,000) = $3,600

**5.** The expected return of an asset is the sum of each return times the probability of that return occurring. So, the expected return of the asset is:

E(R) = .30(–.14) + .70(.22) = .1120, or 11.20%

**6.** The expected return of an asset is the sum of each return times the probability of that return occurring. So, the expected return of the asset is:

E(R) = .20(–.18) + .50(.11) + .30(.29) = .1060, or 10.60%

**11.** The beta of a portfolio is the sum of the weight of each asset times the beta of each asset. So, the beta of the portfolio is:

β*P* = .35(.84) + .25(1.17) + .30(1.11) + .10(1.36) = 1.06

**12.** The beta of a portfolio is the sum of the weight of each asset times the beta of each asset. If the portfolio is as risky as the market, it must have the same beta as the market. Since the beta of the market is one, we know the beta of our portfolio is one. We also need to remember that the beta of the risk-free asset is zero. It has to be zero since the asset has no risk. Setting up the equation for the beta of our portfolio, we get:

β*P* = 1.0 = 1/3(0) + 1/3(1.27) + 1/3(β*X*)

Solving for the beta of Stock X, we get:

β*X* = 1.73

**13.** CAPM states the relationship between the risk of an asset and its expected return. CAPM is:

E(*Ri*) = *Rf* + [E(*RM*) – *Rf*] × β*i*

Substituting the values we are given, we find:

E(*Ri*) = .038 + (.10 – .038)(1.05) = .1031, or 10.31%

**14.** We are given the values for the CAPM except for the β of the stock. We need to substitute these values into the CAPM, and solve for the β of the stock. One important thing we need to realize is that we are given the market risk premium. The market risk premium is the expected return of the market minus the risk-free rate. We must be careful not to use this value as the expected return of the market. Using the CAPM, we find:

E(*Ri*) = .102 = .045 + .075βi

β*i* = 0.76

**15.** Here we need to find the expected return of the market using the CAPM. Substituting the values given, and solving for the expected return of the market, we find:

E(*Ri*) = .124 = .042 + [E(*RM*) – .042](1.17)

E(*RM*) = .1121, or 11.21%

**16.** Here we need to find the risk-free rate using the CAPM. Substituting the values given, and solving for the risk-free rate, we find:

E(*Ri*) = .133 = *Rf* + (.105 – *Rf*)(1.45)

.13 = *Rf* + .15225 – 1.45*Rf*

*Rf* = .0428, or 4.28%

**17.** *a.* Again we have a special case where the portfolio is equally weighted, so we can sum the returns of each asset and divide by the number of assets. The expected return of the portfolio is:

E(*RP*) = (.14 + .021)/2 = .0805, or 8.05%

*b.* We need to find the portfolio weights that result in a portfolio with a β of 0.93. We know the β of the risk-free asset is zero. We also know the weight of the risk-free asset is one minus the weight of the stock since the portfolio weights must sum to one, or 100 percent. So:

β*P* = 0.93 = *wS*(1.25) + (1 – *wS*)(0)

0.93 = 1.25*wS* + 0 – 0*wS*

*wS* = 0.93/1.25

*wS* = .7440

And, the weight of the risk-free asset is:

*wRf* = 1 – .7440 = .2560

*c.* We need to find the portfolio weights that result in a portfolio with an expected return of 9 percent. We also know the weight of the risk-free asset is one minus the weight of the stock since the portfolio weights must sum to one, or 100 percent. So:

E(*RP*) = .09 = .14wS + .021(1 – *wS*)

.09 = .14*wS* + .021 – .021*wS*

.069 = .119*wS*

*wS* = .5798

So, the β of the portfolio will be:

β*P* = .5798(1.25) + (1 – .5798)(0) = 0.725

*d.* Solving for the β of the portfolio as we did in part *a*, we find:

β*P* = 2.50 = *wS*(1.25) + (1 – *wS*)(0)

*wS* = 2.50/1.25 = 2

*wRf* = 1 – 2 = –1

The portfolio is invested 200% in the stock and –100% in the risk-free asset. This represents borrowing at the risk-free rate to buy more of the stock.