1. What is the current value of a bond that pays annual coupon payments at a rate of 3%, has a face value of $1,000 and matures in 4 years if the discount rate is 4%.
Coupon=1000x0.03=30
Bond value= 30/(1.04)^1 + 30/(1.04)^2 + 30/(1.04)^3 + 1030/(1.04)^4
Bond value=28.85 + 27.74 + 26.67 + 880.45
Current value= $963.70

2. What is the current value of a bond that pays semi-annual coupon payments at a rate of 8% per year, has a face value of $1,000, matures in 3 years and has a yield to maturity (in EAR terms) of 6%?
Coupon=(1000x0.08)/2=40
Bond value= 40/(1.06)^0.5 +40/(1.06)^1 + 40/(1.06)^1.5 + 40/(1.06)^2 + 40/(1.06)^2.5 + 1040/(1.06)^3
Current value= $1056.62

3. What is the current yield of a bond that has most recently traded for $1040, has a face value of $1,000 and coupon rate of 10% of its face value?
1000x0.1/1040= 9.62%

4. What is the yield to maturity of a zero coupon bond which has a face value of $1,000 and a maturity of 8 years if it has most recently traded for $750?
Value= FV/(1+YTM)^8
750=1000/(1+YTM)^8
750 x (1+YTM)^8 = 1000
(1+YTM)= 8√1000/750
(1+YTM) = 1.0366
YTM = 3.66%

5. What is the yield to maturity of a bond that pays annual coupon payments at a rate of 7%, has a face value of $1,000, matures in 2 years and has most recently traded at $960

$$\text{If } a \times x^2 + b \times x + c = 0$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

1000x0.07=70
960= 70/(1+YTM) + 1070/(1+YTM)^2
=$960 × (1 + YTM)^7 = $70 × (1 + YTM) + $1070
0=$960 × (1 + YTM)^2 - $70 × (1 + YTM) - $1070
∴ a = 960; b = −70; c = −1070

$$(1 + YTM) = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

(1+YTM) = -(-70)±√(-70)^2-4*960*(-1070)/(2x960)
(1+YTM) = -(-70)±2025.81/(2x960)
(1+YTM) = -(-70)-2025.81/(2x960)=-1.019
(1+YTM) = -(-70)+2025.81/(2x960)=1.09
(1+YTM) = (1.0915.., -1.019)
YTM= 9.2%

GOAL SEEK: 9.28%

6. What is the yield to maturity of the same bond outlined above if it matures in 5 years and not 2?

1000x0.07=70
960= 70/(1+YTM) + 70/(1+YTM)^2 + 70/(1+YTM)^3 + 70/(1+YTM)^4 + 1070/(1+YTM)^5

Goal Seek: 8.0%

7. A firm has a measured level of systematic risk (equity β) of 0.8. The firm is an income firm and has a dividend policy $0.2 per year with no future expected growth. Using the discounted dividend model what is the expected share price if the risk free rate is 1% and the return on the market is 6%?

E[r] = 0.01 + 0.8 x (0.06-0.01) = 0.05
Sp = 0.2/0.05 = $4