Calculations for Chapter 7 - Risk and Return

Expected Value: Mean = Sum of (V x P)

The mathematical equation given in the text looks very complicated, but actually, you are just adding the products of the prices and the probabilities.

Sales Value (V)		Probability (P)		Product V x P	
600	x	0.05	=	30	<<See formula. Insert it once, then drag it down
800	x	0.10	=	80	
1,000	x	0.70	=	700	
1,200	x	0.10	=	120	
1,400	x	0.05	=	70	
		1.00		1000	<<Enter formula for SUM

Standard Deviation: Square root of the Sum of P(V-expected value)2

V- Expected Value calculated above

V	P	V - 1000	squared	times P	
600	0.05	-400	160,000	8,000	<<See formulas, enter once, drag down
800	0.10	-200	40,000	4,000	
1,000	0.70	0	- 0	- 0	
1,200	0.10	200	40,000	4,000	
1,400	0.05	400	160,000	8,000	
				24,000	<<Sum
				155	<<Square Root of Sum

Coefficient of Variation = Standard Deviation / Mean

155 / 1000 = 0.155 or 15.5%

While the formulas look quite complicated, the actual calculations are not that bad at all. You should understand how this was done - you will not be required to do this on an exam.

Calculating the Standard Deviation of a Two-Asset Portfolio

A two-stock portfolio has 30% in Stock A, with an expected return of 21% and a standard deviation of 5%
and the remainder in Stock B, with an 18% expected return and a standard deviation of 2%. The correlation coefficient is 0.6

	Amount	Weight	Expected Return	Standard Deviation	Correlation
Asset A	700,000	30.0%	21%	5%	0.6
Asset B	200,000	70.0%	18%	2%	0.6

The standard deviation for this portfolio is:

σp = √ (30%)2 X (5%)2 + (70%)2 X (2%)2 + (2 X 30% X 70% X 0.6 X 5% X 2%)
σp = √0.000673
σp = 0.0259
σp = 2.59%

(WEIGHT)2 X (SD)2 = FOR BOTH (THEN ADD)

(MULTIPLY BOTH WEIGHTS TIMES BOTH SD TIMES CORRELATION) 2 (THEN ADD)

SQUARE ROOT

Calulating the CAPM

Assume the risk-free rate is 5%, the expected rate of return on the market is 15%, and the beta of your firm is 1.2.
Given these conditions, what is the required rate of return on your company's stock per the capital asset pricing model?

Beta	1.2
Market	15%
Risk Free	5%

CAPM = RF + [b * (rm – RF)]

5% + (1.2 * (15% - 5%)
5% + (1.2 * 10%)
5% + 12%
17%

You will be asked to compute the CAPM on the exam!