CFP BOARD CERTIFIED FINANCIAL PLANNER BOARD OF STANDARDS, INC.
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Provided Formulas

These formulas are provided with the exam booklets when taking the CFP® Certification Examination:

$$V = \frac{D_1}{r - g}$$

$$r = \frac{D_1}{P} + g$$

$$COV_{ij} = \rho_{ij}\sigma_i\sigma_j$$

$$\sigma_p = \sqrt{W_i^2\sigma_i^2 + W_j^2\sigma_j^2 + 2W_iW_jCOV_{ij}}$$

$$\beta_i = \frac{COV_{im}}{\sigma_m^2} = \frac{\rho_{im}\sigma_i}{\sigma_m}$$

$$\sigma_r = \sqrt{\frac{\sum_{t=1}^{n}(r_t - \bar{r})^2}{n}}$$

$$S_r = \sqrt{\frac{\sum_{t=1}^{n}(r_t - \bar{r})^2}{n-1}}$$

$$CV = \frac{Par}{CP} \times P_s$$

$$r_i = r_f + (r_m - r_f)\beta_i$$

$$r_p = r_f + \sigma_p\left(\frac{r_m - r_f}{\sigma_m}\right)$$

$$S_p = \frac{\overline{r_p} - \overline{r_f}}{\sigma_p}$$

$$\alpha_p = \overline{r_p} - \left[\overline{r_f} + \left(\overline{r_m} - \overline{r_f}\right)\beta_p\right]$$

$$T_p = \frac{\overline{r_p} - \overline{r_f}}{\beta_p}$$

$$D = \frac{\sum_{t=1}^{n}\frac{c_t(t)}{(1+i)^t}}{\sum_{t=1}^{n}\frac{c_t}{(1+i)^t}}$$

$$D = \frac{1+y}{y} - \frac{(1+y) + t(c-y)}{c\left[(1+y)^t - 1\right] + y}$$

$$\frac{\Delta P}{P} = -D\left[\frac{\Delta y}{1+y}\right]$$

$$IR = \frac{R_P - R_B}{\sigma_A}$$

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XVIII. EDUCATION CALCULATION (THE UNEVEN CASH FLOW METHOD)

127. James and Staci would like to plan for their son's college education. They would like their son, who was born today, to attend a private university for 6 years beginning at age 18. Tuition is currently $30,000 a year and has increased at an annual rate of 7%, while inflation has only increased at 4% per year. They can earn an after-tax rate of return of 12%. How much must they save at the end of each year if they would like to make the last payment at the beginning of their son's first year of college?

128. David would like to plan for his son's college education. He would like his son, who was born exactly 2 years ago, to attend a private university for 4 years beginning at age 18. Tuition is currently $20,000 a year and has increased at an annual rate of 6%, while inflation has only increased at 3.5% per year. David can earn an after-tax rate of return of 10%. How much must David save at the end of each year if he would like to make his last payment at the beginning of his son's last year of college?

129. Fred would like to plan for his son's college education. He would like his son, who was born today, to attend a public university for 5 years beginning at age 18. Tuition is currently $15,000 a year and has increased at an annual rate of 7%, while inflation has only increased at 4% per year. Fred can earn an after-tax rate of return of 11%. How much must Fred save at the beginning of each year if he would like to make his last payment at the beginning of his son's last year of college?

XIX. RETIREMENT NEEDS ANALYSIS

130. Lesli, a single woman who is age 25, has come to you for help in determining her financial needs in retirement. She would like to retire at age 65, and expects to live to age 95. Her current income is $50,000 per year. She estimates that she will need 80% of her current income annually while in retirement. Lesli expects that her Social Security benefit will be $12,000 per year (in today's dollars). Inflation is expected to average 4%. Lesli expects to make 12% annual return on her investments. How much must Lesli save at the end of each year, beginning now, to meet her retirement goals?

131. Rod, who is age 35, has come to you for help in determining his financial needs in retirement. He would like to retire at age 60, and expects to live to age 100. His current income is $60,000 per year. He estimates that he will need 80% of his current income annually while in retirement. Rod expects that his Social Security benefit will be $16,000 per year (in today's dollars). Inflation is expected to average 3%. Rod expects to make an 10% annual return on his investments. How much must Rod save at the end of each year, beginning now, to meet his retirement goals?

132. Tina, a single woman who is age 40, has come to you for help in determining her financial needs in retirement. She would like to retire at age 62, and expects to live to age 90. Her current income is $35,000 per year. She estimates that she will need 70% of her current income annually while in retirement. Tina expects that her Social Security benefit will be $9,000 per year (in today's dollars). Inflation is expected to average 3.5%. Tina expects to make an 8% annual return on her investments. How much must Tina save at the end of each year, beginning now, to meet her retirement goals?

ITEM SET SCENARIO 2

Al and Irma Dell have resided in New Orleans for several years. During the current year, a fire damaged their home, automobiles, and personal property as follows:

Description	FMV before the fire	FMV after the fire
Dwelling	$200,000	$120,000
Personal property	$ 50,000	$ 25,000
Honda Accord	$ 18,000	$ 14,500
Toyota Camry	$ 20,000	$ 18,000

FMV = fair market value.

Fortunately, the Dells had insurance on the house, automobiles, and personal property.

Homeowners insurance	
Policy type	HO-3
Coverage	$150,000
Deductible	$500
Premium (amount)	$1,025
Liability	$100,000
Medical payments	$1,000
Coinsurance requirement	80%

Automobile insurance		
	Honda Accord	Toyota Camry
Premium	$1,200	$950
Coverage	$50,000/$100,000	$50,000/$100,000
Comprehensive	$250	$500
Collision	$300	$550

They also have an endorsement for personal property to be valued at replacement value.

1. How much will the insurance company pay to have the dwelling repaired?

   A. $80,000
   B. $75,000
   C. $74,500
   D. $64,000

2. How much will the Dells have to pay personally to have the automobiles fixed?

   A. $4,750
   B. $4,650
   C. $850
   D. $750

3. Assume the Dells' adjusted gross income for the current year is $60,000, and assume that they receive the following amounts of insurance proceeds:

Dwelling	$74,500
Personal property	$25,000
Honda Accord	$1,000
Toyota Camry	$1,000

How much of a casualty loss can the Dells deduct on their current federal income tax return?

A. $2,900
B. $9,000
C. $3,000
D. $8,500

ITEM SET SCENARIO 4

Harold is a 55-year-old corporate executive employed with one of the Fortune 500 companies. He is planning to retire at age 65, living in retirement for 25 years, and has accumulated the assets listed below for his retirement. Harold is willing to accept enough risk to meet his goals, but he does not want to accept additional risk, nor does he ever want to die with less than $1 million (in today's dollars) in his account (i.e., he hopes to have at least this much in his estate at the end of the 25-year retirement period).

	Stock portfolio various stocks	Bond portfolio various bonds
Market value	$572,160	$143,040
Average historic return	12%	7%
Standard deviation	15%	9%
Current YTM	N/A	7%
Duration	N/A	5 years
Correlation to the stock market	77.5%	N/A

Note: The correlation coefficient between Harold's stock portfolio and bond portfolio is +40%.

1. Harold is concerned about the volatility of his portfolio and would like some help in assessing the risk. Based on his current allocation between his bond portfolio and his stock portfolio, what is the standard deviation of his entire portfolio (stock and bond portfolio together)?

   A. 12.0%
   B. 12.4%
   C. 12.8%
   D. 13.8%

2. Harold has taken an active role in developing his financial goals by reading *Money Magazine*. After reading about diversification, he has become concerned about the diversity of his stock portfolio. What portion of the risk in his stock portfolio is inherent to a specific business or industry?

   A. 20%
   B. 40%
   C. 60%
   D. 80%

3. What would be the approximate decline in the value of Harold's bond portfolio if interest rates increase to 7.43%?

   A. 1.0%
   B. 2.0%
   C. 3.0%
   D. 5.8%

4. Harold knows that the bond market has been performing well. What is the probability of having a return of at least 16% from his bond portfolio?

   A. 9%
   B. 16%
   C. 22%
   D. 34%

5. Harold's previous financial planner told him that he should allocate 45% of his portfolio to stocks and 55% to bonds. How much would his portfolio be worth when he retired if he followed this advice? Assume the portfolio retains this 45%/55% asset allocation until his retirement.

   A. $1,732,375
   B. $1,772,428
   C. $1,773,385
   D. $1,813,313

ITEM SET SCENARIO 7

Mrs. Keri Mayer, age 64, died September 8, 2010. She had been employed with Reed Corporation, where she had a vested retirement account and a completely vested Section 401(k) plan account. In addition, she had an IRA and other property listed below. She had not started distributions. Assume her executor makes any appropriate elections.

Valuation of Her Interest

Asset	9/08/10	Date of disposition 1/1/11	Adjusted cost basis	Titling or beneficiary*
Qualified retirement account	$1,000,000		$0	Beneficiary H
Section 401(k) plan	750,000		0	Beneficiary S
IRA	2,000,000		0	Beneficiary D
½ personal residence	400,000**		280,000***	JTWROS with H
Annuity (10-year certain) (8%)	300,000		200,000	Beneficiary H
Installment note(5-year/9%)	200,000		160,000	Willed to H
Other property	250,000	$300,000	80,000	Willed to H

*H = husband
S = son
D = daughter

** Represents 50% of value of personal residence
*** Represents 50% of total basis

1. What is her husband's adjustable taxable basis in the installment note?

   A. $0
   B. $160,000
   C. $183,789
   D. $200,000

2. What is her husband's adjusted taxable basis in the other property?

   A. $0
   B. $80,000
   C. $250,000
   D. $300,000

3. What is her husband's basis in the annuity?

   A. $0
   B. $200,000
   C. $290,000
   D. $300,000

4. What is her husband's basis in the personal residence?

   A. $400,000
   B. $540,000
   C. $680,000
   D. $800,000

5. What is her son's basis in the Section 401(k) plan?

   A. $0
   B. $300,000
   C. $600,000
   D. $350,000

ITEM SET SCENARIO 8

On August 23, 2010, Fred, a single taxpayer, gave his son, Sammy, a gift of ABC stock with a fair market value of $100,000, as of the date of the gift. Fred made only this gift this year. Fred had an adjusted taxable basis (cost) in the ABC stock of $160,000 and acquired the stock on July 31, 2002. Fred made only one previous taxable gift in his lifetime, a gift to Sammy in the amount of $600,000, made on August 23, 2008. Fred has a remaining net worth of $1.3 million.

1. What was Fred's gift tax to be paid on the gift of the ABC stock?

   A. $0
   B. $20,160
   C. $23,800
   D. $37,900

2. Assume that on December 31, 2010, Sammy sold the ABC stock for $140,000. What are the income tax consequences to Sammy for this sale?

   A. No gain or loss
   B. Short-term capital gain of $40,000
   C. Long-term capital gain of $40,000
   D. Short-term capital loss of $20,000

3. Assume that Sammy sold the ABC stock on December 31, 2010, for $90,000. What are the income tax consequences to Sammy for this sale?

   A. No gain or loss
   B. Short-term capital loss of $10,000
   C. Long-term capital loss of $10,000
   D. Short-term capital loss of $70,000

4. Regardless of what Sammy does with the stock, what are the income tax consequences to Fred in 2010 with respect to the gift of ABC stock?

   A. No gain or loss
   B. Short-term capital loss of $60,000, fully deductible
   C. Long-term capital loss of $60,000, fully deductible
   D. Short-term capital loss of $60,000, limited to $3,000 deductible

ITEM SET SCENARIO 10

Bob invested $5 million in investment A, and it is worth $6.5 million at the end of year 1. He also invested $8 million in investment B, and it is worth $10 million at the end of year 1. Bob's required rate of return is 10%.

1. Which of the following investments has a net present value of $909,090.90?

   A. Investment A
   B. Investment B
   C. Both investment A and investment B
   D. Neither investment A nor investment B

2. Which of the following investments has an IRR of 25%?

   A. Investment A
   B. Investment B
   C. Both investment A and investment B
   D. Neither investment A nor investment B

3. Which of the following investments has an IRR of 30%?

   A. Investment A
   B. Investment B
   C. Both investment A and investment B
   D. Neither investment A nor investment B

4. Which of the following investments has a net present value of $1,909,090.09?

   A. Investment A
   B. Investment B
   C. Both investment A and investment B
   D. Neither investment A nor investment B

ITEM SET SCENARIO 11

Doris buys 1,000 shares of ABC stock for $100 per share, with an initial margin of 55% and a maintenance margin of 30%.

1. At what price will Doris receive a margin call?

   A. $45.00
   B. $55.00
   C. $64.29
   D. $69.23

2. If the stock drops to $70 per share, how much cash per share will Doris be required to deliver?

   A. $0.00
   B. $6.00
   C. $6.54
   D. $8.57

3. If the stock drops to $50 per share, how much cash will Doris be required to deliver to cover the margin call?

   A. $2,000
   B. $5,000
   C. $10,000
   D. $19,220

ITEM SET SCENARIO 12

You have a 2-asset portfolio with equal weighting and the following characteristics:

	Return	Risk (standard deviation)
A	5%	20%
B	15%	40%

1. If the correlation coefficient between assets A and B is 0.6, where does the standard deviation of the 2-asset portfolio fall?

   A. Below 15%
   B. 15–30%
   C. 30–50%
   D. Over 50%

2. If the correlation coefficient between assets A and B is equal to 1, where does the standard deviation of the 2-asset portfolio fall?

   A. 15–29%
   B. 30%
   C. 31–50%
   D. Cannot be determined

ITEM SET SCENARIO 13

Jennifer is in the process of purchasing a house for $175,000 with a down payment of 20%. She will finance the balance over 30 years at 8%.

1. Assuming she purchases the above house, what will be Jennifer's monthly payment?

   A. $1,020.47
   B. $1,027.27
   C. $1,275.58
   D. $1,284.09

2. Assume Jennifer buys the house on January 1 of the current year. If payments are due the first of each month, how much qualified residence interest can she deduct for the current year on her tax Form 1040?

   A. $10,266.67
   B. $10,231.53
   C. $11,157.74
   D. $11,299.97

3. If Jennifer financed the house over 15 years instead of 30, how much interest would she save over the life of the loan (assuming the same interest rate)?

   A. $0
   B. $55,915.20
   C. $89,175.60
   D. $128,993.40

ITEM SET SCENARIO 16

Matching: You may use an answer more than once or not at all.

Auto Coverage

A. Uninsured motorists (bodily injury)
B. Collision
C. Comprehensive (other than collision)
D. None of the above

Event

1. ____ A bird collides with your windshield.
2. ____ You back your car into a tree on your property.
3. ____ An uninsured motorist damages your automobile but does not hurt you.
4. ____ An uninsured motorist strikes you while you are walking.

ITEM SET SCENARIO 27

Aaron, age 62, is preparing to retire. Aaron has three adult children who are named as equal beneficiaries of Aaron's life insurance policy. He has asked you to help him determine the implications of transferring, surrendering, or borrowing from his whole life insurance policy. The policy information is as follows:

Description	Amount
Death benefit of policy	$1 million
Cash value of policy	$90,000
Outstanding loan on policy	$35,000
Net premiums paid	$58,000

1. If Aaron terminates the policy, how much cash will he receive from the insurance company?

   A. $32,000
   B. $35,000
   C. $58,000
   D. $55,000

2. How much will be included in Aaron's taxable income if he terminates the policy?

   A. $32,000
   B. $35,000
   C. $58,000
   D. $55,000