Financial calculator practice problems

1. Lee Chan is considering buying a parcel of land for $28,000 which the real estate agent assures him will appreciate in value at a rate of 12% annually. If the agent is correct, what would the land be worth in 9 years?

   A. 77,646
   B. 78,755
   C. 69,327
   D. 71,625

2. Annie Washington wants to accumulate $70,000 in 6 years for her son's college education. She can deposit $800 at the beginning of every month for the next 6 years. She expects to earn 8% compounded monthly on her investment. Will she be able to reach her goal?

   A. Yes. She will have $73,620
   B. No. She will have $6,338
   C. No. She will have $5,869
   D. Yes. She will have $74,111

3. Andrew Billings purchased a sailboat on credit for $25,000. He wants to have it paid in full within 7 years. What monthly payment should be made in order to attain this goal if his interest rate on the loan is 11%.

   A. $424
   B. $4,780
   C. $5,305
   D. $428

4. Roosevelt Scott has $27,000 to invest now. If he wishes to accumulate $100,000 in 15 years, what annual interest must he obtain to reach his goal if the interest is compounded semi-annually?

   A. 4.46%
   B. 8.92%
   C. 9.12%
   D. 8.23%

5. How long would it take for $6,000 to triple at an annual rate of 7%?

    A. More than 16 years
    B. Less than 2 years
    C. 3-5 years
    D. 13-15 years

6. Jane O'Toole has been investing $500 at the beginning of each quarter for the past 9 years. She has been earning 6.75% interest compounded quarterly. What was the balance 4 years ago?

    A. $11,778
    B. $3,054
    C. $11,976
    D. $9,250

7. Darren Meyer is financing the purchase of his new motorcycle through a bank that requires 12% interest compounded monthly over the 3-year term of the loan. He will make a down payment of $1,000 and then make monthly payments of $200. What is the most he can spend on the motorcycle?

    A. $6,022
    B. $7,022
    C. $7,082
    D. $1,480

8. Jose and Lupe Sanchez are ready to retire. They want to receive the equivalent of $80,000 in today's dollars at the beginning of each year for the next 12 years. They assume that inflation will average 7% over the long run, and they can earn a 10% annual after-tax return on investments. What lump sum do the Sanchez's need to invest today to attain their goal?

    A. $828,322
    B. $805,731
    C. $119,447
    D. $904,585

9. $875 is deposited at the end of every 6-month period. At 9.25% interest, what will be the balance in 10 years?

    A. $29,098
    B. $14,698
    C. $27,812
    D. $13,453

10. Louise Cannon purchased 200 shares of ABC at $15 per share 7 years ago. (This stock does not pay dividends.) Today she sold all 200 shares for $4,618. What was the average annual compound rate of return on her investment before taxes?

   A. 6.36%
   B. 16.69%
   C. 13.69%
   D. 5.78%

11. John Spiegelmeyer just won the lottery! He will receive $40,000 at the end of each year for the next 15 years. His opportunity cost on investments is 8.5% compounded annually (assuming he received the money today). What is the present value?

   A. $332,196
   B. $332,169
   C. $360,404
   D. $333,528

12. Maria Conti wants to withdraw $2,100 at the beginning of each month from her $350,000 inheritance which she has deposited in a money market account earning 7%. How many years will pass before her inheritance is exhausted?

   A. 48 years, 9 months (+/– 1 month)
   B. 585 years
   C. 73 years, 4 months (+/– 1 month)
   D. 617 years

13. James Turner wishes to accumulate $500,000 to purchase a home in 10 years. He can earn an annual compound rate of 12% in the Acme Mutual Fund. How much should he invest at the end of each year to accomplish his goal?

   A. $25,439
   B. $41,667
   C. $23,382
   D. $28,492

14. Charles and Clarisse Lincoln have just bought a vacation home in Florida for $56,000. They expect this house to appreciate 6% per year. What will it be worth in 10 years?

    A. $475,836
    B. $255,142
    C. $100,287
    D. $99,207

15. 20-year-old Karen Lee has $16,308.56 in her savings account which her grandparents opened the day she was born. If the account earns 5% interest compounded daily (use 360 days), how much did her grandparents originally deposit assuming there have been no other deposits or withdrawals?

    A. $6,000
    B. $6,147
    C. $7,200
    D. $8,154

16. Milan Shah invested $15,000 into a mutual fund that promised a return of $30,000 in 5 years. What average annual compound rate of return (before taxes) would this investment have to earn in order for this to be true?

    A. 14.87%
    B. 10.23%
    C. 15.86%
    D. 13.87%

17. Felicia Serrano wants to have $15,000 in 4 years to buy a new car. She can earn 5.25% interest compounded quarterly in her passbook savings account. How much should she deposit today to reach this goal?

    A. $12,224
    B. $14,238
    C. $12,175
    D. $12,397

18. Tammy and Jim are planning to build a vacation cottage on property they own in California. Their wealthy friends have offered to loan them $45,000 at 8.25% interest. If they can make payments of $375 each month, how many years will it take them to pay off the loan?

    A. 255 years
    B. 20 years, 10 months (+/– 1 month)
    C. 7 years, 4 months (+/– 1 month)
    D. 21 years, 3 months (+/– 1 month)

19. $60,000 is deposited into a money market account earning 6.25% interest compounded semi-annually. What be the balance in 3 years?

    A. $72,166
    B. $71,968
    C. $74,600
    D. $73,165

20. Abbie Ambitious, age 22, graduated college and is working full time. She invested $6,000 into her Roth IRA. If she never invests more into the account, what will be the value of the $6,000 at age 72, if she can earn 8%?

    A. 0
    B. $281,410
    C. $704,345
    D. $3,442,621

21. If Abbie from the previous question invested $6,000 into her Roth IRA every year for 50 years earning 8%, what amount would she have saved at age 72?

    A. $3,442,621
    B. $4,642,192
    C. $5,000,000
    D. A boat load of money

22. Cathy and Jared plan to live on social security and withdrawals of $48,000 at the end of each year from their retirement investments. If they can earn 8%, how much is needed in their accounts at the beginning of retirement?

    A. Not enough information given to solve
    B. $48,000
    C. $600,000
    D. $648,000

23. Harriet Moore bought 7 rare stamps worth $300 each. She held them for 10 years before selling all of them for $2,800. What was the IRR on this investment?
   A. 2.92%
   B. 0.98%
   C. 2.84%
   D. 1.92%

24. Maria Torelli bought 200 shares of RLD for $47 per share. RLD paid dividends of $0.38/share the first quarter; $0.61/share the second quarter/ $0.26/share the third and $0.71 the fourth quarter, she sold all her RLD holdings at $51 per share. What was the IRR on this investment?

   A. 3.07%
   B. 9.84%
   C. 2.46%
   D. 12.28%

25. Lila Meriweather purchased a bond for $775. The coupon rate is 8% and interest is paid semi-annually. The bond is callable in 7 years at $1,150 and matures in 20 years. What is the yield to maturity on this bond?

   A. 5.38%
   B. 10.76%
   C. 11.03%
   D. 5.51%

26. Edward Hayes purchased 12 zero coupon bonds for $250 each. The bonds will mature in 10 years. What is the IRR on this investment?

   A. 7.43%
   B. 14.35%
   C. 14.87%
   D. 29.74%

27. Four years ago, Darlene Brown invested $20,000 in 20 newly (par) issued 5-year Treasury notes. She receives payments of 10.25% semi-annually. Today, the bonds are worth $25,876. What is the internal rate of return on this investment?

   A. 7.90%
   B. 15.79%
   C. 13.30%
   D. 7.00%

28. Anne Devereaux purchased 90 shares of KSJ preferred stock for $32.00 per share. It paid a dividend of 6.1%, paid quarterly. After holding the stock for 3 years, she sold it for $25.00 per share. What was the IRR on this investment?

   A. –0.33%
   B. –1.33%
   C. –1.29%
   D. –2.04%

29. Arnold Steuben bought a collection of antique vases 6 years ago for $2,500. The following year, he bought another vase for $150. The second year, he added to the collection by purchasing another vase for $200. The third and fourth years, Arnold did not buy any vases. The fifth year, he acquired two more vases for $175 apiece. In the sixth year, he bought one more vase for $100. The whole collection was sold in year six for $3,600. What was the IRR on this investment?

   A. 9.96%
   B. 2.58%
   C. 1.70%
   D. 1.43%

30. Rosemary Levin bought 18 units of Amberland, a limited partnership, to provide for her retirement. Each unit cost $879.25. She has received a total annual payment of $1,100, paid quarterly for the past 7 years. She sold her units of Amberland for $985.50 per unit at the end of the seventh year. What was Rosemary's internal rate of return on the investment?

   A. 8.24%
   B. 2.06%
   C. 3.30%
   D. 4.12%

31. Sean McNally purchased a bond for $1,050. The coupon rate is 10% and interest is paid semi-annually. The bond is callable in 4 years at $1,200 and matures in 10 years. What is the yield to call on this bond?

    A. 6.20%
    B. 9.22%
    C. 8.50%
    D. 12.39%

32. Mary Hutley's grandmother gave her a U.S. Treasury note with a coupon rate of 8%, paid semi-annually. It will mature in 10 years. The bond was purchased in the secondary market for $1,050. What is the internal rate of return on this investment?

    A. 3.64%
    B. 6.80%
    C. 7.59%
    D. 7.29%

33. Jeffrey Jackson bought a bond for $915. The coupon rate is 9.5% and interest is paid semi-annually. The bond is callable in 9 years at $1,175 and matures in 25 years. What is the yield to call on this bond?

    A. 12.20%
    B. 6.10%
    C. 10.46%
    D. 2.80%

34. Cathie Michaels bought an 8-unit apartment building for a price of $560,000 with an $80,000 down payment. Because of necessary repair work, the net cashflow in the first year was a negative $50,000. The following years showed a positive net cashflow of $28,000 in the second year and $46,000 in the third year. In the third year, she sold the building for $750,000. What was her IRR on this investment?

    A. 45.08%
    B. 46.21%
    C. 69.75%
    D. 50.53%

35. Ken Montague owns a bond with a nominal rate of 6%, paid semi-annually. The bond matures in 5 years and comparable bonds are yielding 5.5%. If Ken were to sell this bond, what price should he receive?

   A. $1,021.60
   B. $811.56
   C. $1,280.20
   D. $1,022.97

36. Colleen Abernathy is considering purchasing a Technotron bond with a coupon rate of 9.75% payable semi-annually. The bond matures in 25 years. Comparable bonds with the same maturity are yielding 8.5%. What price should colleen be willing to pay for this bond?

   A. $580.75
   B. $1,128.71
   C. $1,066.31
   D. $1.127.93

37. Peter and Linda Albert are both age 48. They plan to retire at age 67 which will be their FRA (full retirement age) for Social Security retirement benefits. The Alberts have concerns that they could run out of money during retirement as Peter's parents did. They want to assume a post-retirement period of 30 years. With the assistance of their financial planner, they are assuming that to maintain their current lifestyle in retirement, their annual retirement needs as expressed in today's dollars is $80,000. They further assume they will enjoy a 6% after-tax return on their investments and that inflation will average 4% in both their pre-and post-retirement years. What lump-sum dollar amount will the Alberts need to have on hand at the beginning of their retirement period?

   A. $3,888,479
   B. $3,815,098
   C. $3,775,481
   D. $6,885,842

38. Mom and Dad expect that their 7-year-old son, Felix, will attend State College when he turns age 18. The cost of State College in today's dollars is $25,000. The anticipated CPI in the foreseeable future is 4%. The college inflation rate is anticipated to be 6.5 % for at least the next 25 years. As equity investors, Mom and Dad believe they can earn an 8% after-tax rate of return. If Felix will attend State U for a four-year bachelor's degree in marketing, what amount should Mom and Dad save at the end of each year to fund Felix's college education?

A. $10,891
B. $11,112
C. $11,762
D. $12,737

39. Heath Harrison is a 52-year-old confirmed bachelor. He currently earns $100,000 per year as the manager of a trendy clothing boutique. He anticipates that he will spend 80% of that amount annually when he retires at age 65. He anticipates 28 post-retirement years. His Social Security retirement benefits will provide him with $3,000 per month and will increase with inflation. The assumptions upon which he and his financial planner have agreed is that Heath can earn an after-tax rate of 6% return on his investments and that inflation will average 3% during both his pre-and post-retirement years. Considering the information presented in this question, what amount should Heath save at the end of each year to fund his retirement income needs?

A. $28,562
B. $17,893
C. $66,158
D. $66,793

40. Niles and Nora Nervous, a married couple, both age 45 do not want to run out of money during their retirement years. They want to live off the interest income only and leave the principal of their money to their children after they die. They believe they will need $100,000 per year in their post-retirement years. Presuming they can earn an after-tax rate of 10% on their investments and that inflation will average 5% in both their pre-and post-retirement years, what lump-sum amount will they require at retirement given that they do not wish to spend down their principal after they stop working?

A. $1,100,000
B. $2,000,000
C. $2,100,000
D. $2,200,000

41. Savannah Saver currently earns $90,000 per year as an independent interior designer. She is currently age 45. She expects that she will spend 80% of her current earnings in her post-retirement years which will begin when she reaches age 65. She expects that her Social Security retirement benefit will amount to $2,500 per month. As an investor with a relatively high-risk tolerance, Savannah expects to earn an after-tax rate of 10% on her investments. She and her financial planner have agreed to assume that inflation will average 3% in the future. She expects to live to age 85. Savanna is a disciplined saver who will make deposits at the end of each month to achieve the goal of adequate retirement income. How much should Savannah save at the end of every month?

    A. $1,075
    B. $1,148
    C. $1,634
    D. $1,024

42. It has been determined that when Matthew Mathmajor enters college sixteen years from now his parents need to have accumulated $485,000 by that time. Presume that the consumer price index is 6% and the college inflation rate is 8%. Matthew's parents are somewhat conservative investors who expect an after-tax rate of return of 5% on their selected investments. What amount of money should Matthew's parents deposit at the end of each month to meet this goal?

    A. $1,240
    B. $1,995
    C. $1,654
    D. $1,973

Financial calculator answer key and keystrokes

Question 1: A

Elements:

Present Value	–28000
Future Value	solve for
Payments	N/A
Number of periods	9
Interest	12

Keystrokes:

10B	12C
gold, clear all	F, CLX
1, gold, P/YR	---
28000, +/–, PV	28000, CHS, PV
12, I/YR	12, i
9, N	9, n
FV	FV

Answer: 77,646

Question 2: D

Elements:

Present Value	N/A
Future Value	Solve for
Payments	–800 Begin mode
Number of periods	6 × 12
Interest	8 (÷ 12 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
12, gold, P/YR	---
gold, Beg/End (BEG on display)	g, BEG
800, +/–, PMT	800, CHS, PMT
6, gold, ×P/YR	6, ENTER, 12, ×, n
8, I/YR	8, ENTER, 12, ÷, i
FV	FV

Answer: $74,111

Question 3: D

Elements:

Present Value	25000
Future Value	N/A
Payments	solve for
Number of periods	7 × 12
Interest	11 (÷ 12 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
12, gold, P/YR	---
gold, Beg/End (display clears)	g, END
25000, PV	25000, PV
7, gold, ×P/YR	7, ENTER, 12, ×, n
11, I/YR	11, ENTER, 12, ÷, i
PMT	PMT

Answer: $428 PV is entered as a positive since it is borrowed money

Question 4: B

Elements:

Present Value	–27000
Future Value	100000
Payments	N/A
Number of periods	15 × 2
Interest	solve for (× 2 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
2, gold, P/YR	---
27000, +/–, PV	27000, CHS, PV
100000, FV	100000, FV
15, gold, ×P/YR	15, ENTER, 2, ×, n
I/YR	i, ENTER, 2, ×

Answer: 8.92%

Question 5: A

Elements:

Present Value	–6000
Future Value	18000
Payments	N/A
Number of periods	solve for
Interest	7

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
6000, +/–, PV	6000, CHS, PV
18000, FV	18000, FV
7, I/YR	7, i
N	n

Answer: 16 years, 3 months (10B), 17 years (12C)

Question 6: C

Elements:

Present Value	N/A
Future Value	solve for
Payments	–500 (Begin mode)
Number of periods	5 × 4
Interest	6.75 (÷ 4 for 12C)

The number of years is 5 because the question asks what the balance (future value at that time) was four years ago and the total time she has been investing is 9 years (9 – 4 = 5).

Keystrokes:

10B	12C
gold, clear all	f, CLX
4, gold, P/YR	---
gold, Beg/End (BEG on display)	g, BEG
500, +/–, PMT	500, CHS, PMT
5, gold, ×P/YR	5, ENTER, 4, ×, n
6.75, I/YR	6.75, ENTER, 4, ÷, i
FV	FV

Answer: $11,976

Question 7: B

Elements:

Present Value	solve for (+ 1,000)
Future Value	N/A
Payments	–200
Number of periods	3 × 12
Interest	12 (÷ 12 for 12C)

You will need to add $1,000 from the present value calculation because Darren is making a $1,000 down payment so can afford a motorcycle worth $1,000 more that the loan amount.

Keystrokes:

10B	12C
gold, clear all	f, CLX
12, gold, P/YR	---
gold, Beg/End (display clears)	g, END
200, +/–, PMT	200, CHS, PMT
3, gold, ×P/YR	3, ENTER, 12, ×, n
12, I/YR	12, ENTER, 12, ÷, i
PV, +, 1000, =	PV, ENTER, 1000, +

Answer: $7,022

Question 8: A

Elements:

Present Value	solve for
Future Value	N/A
Payments	80000
Number of periods	12
Interest	$\left[\dfrac{1 + .10}{1 + .07} - 1 \right] \times 100$

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
gold, Beg/End (BEG on display)	g, BEG
80000, PMT	80000, PMT
12, N	12, n
1.1, ÷, 1.07, =, –1, =, ×, 100, =, I/YR	1.1, ENTER, 1.07, ÷, 1, –, 100, ×, i
PV	PV

Answer: $828,322

Question 9: C

Elements:

Present Value	N/A
Future Value	solve for
Payments	–875 (End mode)
Number of periods	10 × 2
Interest	9.25 (÷ 2 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
gold, Beg/End (display clears)	g, END
2, gold, P/YR	---
875, +/–, PMT	875, CHS, PMT
10, gold, ×P/YR	10, ENTER, 2, ×, n
9.25, I/YR	9.25, ENTER, 2, ÷, i
FV	FV

Answer: $27,812

Question 10: A

Elements:

Present Value	–200 × 15
Future Value	4618
Payments	N/A
Number of periods	7
Interest	solve for

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
200, ×, 15, =, +/–, PV	200, Enter, 15, ×, CHS, PV
4618, FV	4618, FV
7, N	7, n
I/YR	i

Answer: 6.36%

Question 11: B

Elements:

Present Value	solve for
Future Value	N/A
Payments	40000 (End mode)
Number of periods	15
Interest	8.5

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
gold, Beg/End (display clears)	g, END
40000, PMT	40000, PMT
15, N	15, n
8.5, I/YR	8.5, i
PV	PV

Answer: $332,169

Question 12: A

Elements:

Present Value	-350000
Future Value	N/A
Payments	2100 (Begin mode)
Number of periods	solve for (÷ 12)
Interest	7

Keystrokes:

10B	12C
gold, clear all	f, CLX
12, gold, P/YR	---
gold, Beg/End (BEG in display)	g, BEG
350000, +/–, PV	350000, CHS, PV
2100, PMT	2100, PMT
7, I/YR	7, ENTER, 12, ÷, i
N, ÷, 12, =	n, ENTER, 12, ÷

Answer: 48 years, 8 months (10B), 48 years, 9 months (12C)

Question 13: D

Elements:

Present Value	N/A
Future Value	500000
Payments	solve for (End mode)
Number of periods	10
Interest	12

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
gold, Beg/End (display clears)	g, END
500000, FV	500000, FV
10, N	10, n
12, I/YR	12, i
PMT	PMT

Answer: $28,492

Question 14: C

Elements:

Present Value	–56000
Future Value	solve for
Payments	N/A
Number of periods	10
Interest	6

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
56000, +/–, PV	56000, CHS, PV
10, N	10, n
6, I/YR	6, i
FV	FV

Answer: $100,287

Question 15: A

Elements:

Present Value	solve for
Future Value	16308.56
Payments	N/A
Number of periods	20 × 360
Interest	5 (÷ 360 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
360, gold, P/YR	---
16,308.56, FV	16,308.56, FV
20, gold, ×P/YR	20, ENTER, 360, ×, n
5, I/YR	5 ENTER, 360, ÷, i
PV	PV

Answer: $6,000

Question 16: A

Elements:

Present Value	–15000
Future Value	30000
Payments	N/A
Number of periods	5
Interest	solve for

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
15000, +/–, PV	15000, CHS, PV
30000, FV	30000, FV
5, N	5, n
I/YR	i

Answer: 14.87%

Question 17: C

Elements:

Present Value	solve for
Future Value	15000
Payments	N/A
Number of periods	4 × 4
Interest	5.25 (÷ 4 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
4, gold, P/YR	---
15000, FV	15000, FV
4, gold, ×P/YR	4, ENTER, 4, ×, n
5.25, I/YR	5.25, ENTER, 4 ÷, i
PV	PV

Answer: $12,175

Question 18: D

Elements:

Present Value	45000
Future Value	N/A
Payments	–375 (End mode)
Number of periods	solve for (÷ 12)
Interest	8.25 (÷ 12 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
12, gold, P/YR	---
gold, Beg/End (display clears)	g, END
45000, PV	45000, PV
375, +/–, PMT	375, CHS, PMT
8.25, I/YR	8.25, ENTER, 12, ÷, i
N, ÷, 12, =	n, ENTER, 12, ÷

Answer: 21 years, 3 month (+/- 1 month)

Question 19: A

Elements:

Present Value	–60000
Future Value	solve for
Payments	N/A
Number of periods	3 × 2
Interest	6.25 (÷ 2 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
2, gold, P/YR	---
60000, +/–, PV	60000, CHS, PV
3, gold, ×P/YR	3, ENTER, 2, ×, n
6.25, I/YR	6.25, ENTER, 2, ÷, i
FV	FV

Answer: $72,166

Question 20: B

Elements:

Present Value	-6000
Future Value	Solve for
Payments	N/A
Number of periods	50
Interest	8

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
6000, +/-, PV	6000, CHS, PV
50 N	50 N
8 I/YR	8 i
FV	FV

Answer: $281,410

Question 21: A

Elements:

Present Value	0
Future Value	Solve for
Payments	–6000
Number of periods	50
Interest	8

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
6000, +/–, PMT	6000, CHS, PMT
50, N	50, n
8, I/YR	8, i
FV	FV

Answer: $3,442,621

Question 22: C

Answer: $600,000. You do not need to use a financial calculator to solve this question as you do not know the number of years. You are determining what starting amount would generate $48,000 per year if earning 8% (48000 ÷ .08 = 600000). If the question noted the $48,000 was needed at the beginning of retirement, the answer would be "D" or $648,000 (600000 + 48000).

Question 23: A

Elements:

Present Value	–2100 (7 × 300)
Future Value	2800
Payments	N/A
Number of periods	10
Interest	solve for

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
2100, +/–, PV	2100, CHS, PV
2800, FV	2800, FV
10, N	10, n
I/YR	i

Answer: 2.92%

Question 24: D

Elements:

Original investment	–47
quarter 1	.38
quarter 2	.61
quarter 3	.26
quarter 4	51.71 (.71 dividend + $51 sale price); (× 4 for 12C to annualize)

Notice that it's not necessary to multiply everything by 200 shares because the number of shares remains consistent, so the IRR calculation is based on share price and dividend amounts.

Keystrokes:

10B	12C
gold, clear all	f, CLX
4, gold, P/YR	---
47, +/–, CFj	47, CHS, g, CFo
.38, CFj	.38, g, CFj
.61, CFj	.61, g, CFj
.26, CFj	.26, g, CFj
51.71, CFj	51.71, g, CFj
gold, IRR/YR	f, IRR, 4, ×

Answer: 12.28%

Question 25: B

Elements:

Present Value	−775
Future Value	1000
Payments	40 (8% of 1000 ÷ 2)
Number of periods	40 (20 × 2)
Interest	solve for (× 2 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
2, gold, P/YR	---
775, +/−, PV	775, CHS, PV
1000, FV	1000, FV
40, PMT	40, PMT
20, gold, ×P/YR	40, n
I/YR	i, 2, ×

Answer: 10.76%

Question 26: B

Elements:

Present Value	−3000 (12 × 250)
Future Value	12000
Payments	N/A
Number of periods	20 (10 x 2)
Interest	solve for (× 2 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
2, gold, P/YR	---
3000, +/−, PV	3000, CHS, PV
12000, FV	12000, FV
10, gold, xP/YR	10, ENTER, 2, x, n
I/YR	I, 2, x

Answer: 14.35%

Question 27: B

Elements:

Present Value	–20000
Future Value	25876
Payments	1025 (10.25% of 20000 ÷ 2)
Number of periods	8 (4 × 2)
Interest	solve for (× for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
2, gold, P/YR	---
20000, +/–, PV	20000, CHS, PV
25876, FV	25876, FV
1025, PMT	1025, PMT
4, gold, ×P/YR	8, n
I/YR	i, 2, ×

Answer: 15.79%

Question 28: B

Elements:

Present Value	–32
Future Value	25
Payments	.488 (32 × .061 ÷ 4)
Number of periods	12 (3 × 4)
Interest	solve for (× 4 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
4, gold, P/YR	---
32, +/–, PV	32, CHS, PV
25, FV	25, FV
.488, PMT	.488, PMT
12, N	12, n
I/YR	i, ENTER, 4, ×

Answer: –1.33%

Question 29: C

Elements:

Original investment	–2500
year 1	–150
year 2	–200
year 3	0
year 4	0
year 5	–350 (175 × 2)
year 6	3500 (3600 – 100)

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
2500, +/–, CFj	2500, CHS, g, CFo
150, +/–, CFj	150, CHS, g, CFj
200, +/–, CFj	200, CHS, g, CFj
0, CFj	0, g, CFj
0, CFj	0, g, CFj
350, +/–, CFj	350, CHS, g, CFj
3500, CFj	3500, g, CFj
gold, IRR/YR	f, IRR

Answer: 1.70%

Question 30: A

Elements:

Present Value	–879.25
Future Value	985.5
Payments	(1100 ÷ 18 ÷ 4)*
Number of periods	28 (7 × 4)
Interest	solve for (× 4 for 12C)

*Because the answer contains a repeating decimal, we will enter the calculation during the keystrokes below to ensure accuracy

Keystrokes:

10B	12C
gold, clear all	f, CLX
4, gold, P/YR	---
879.25, +/–, PV	879.25, CHS, PV
985.5, FV	985.5, FV
1100, ÷, 18, ÷, 4, =, PMT	1100, ENTER, 18, ÷, 4, ÷, PMT
28, N	28, n
I/YR	i, ENTER, 4, ×

Answer: 8.24%

Question 31: D

Elements:

Present Value	−1050
Future Value	1200
Payments	50 (10% of 1000 ÷ 2)
Number of periods	8 (4 × 2)
Interest	solve for (× 2 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
2, gold, P/YR	---
1050, +/–, PV	1050, CHS, PV
1200, FV	1200, FV
50, PMT	50, PMT
4, gold, ×P/YR	8, n
I/YR	i, 2, ×

Answer: 12.39%

Question 32: D

Elements:

Present Value	−1050
Future Value	1000
Payments	40 (8% of 1000 ÷ 2)
Number of periods	20 (10 × 2)
Interest	solve for (× 2 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
2, gold, P/YR	---
1050, +/–, PV	1050, CHS, PV
1000, FV	1000, FV
40, PMT	40, PMT
10, gold, ×P/YR	20, n
I/YR	i, 2, ×

Answer: 7.29%

Question 33: A

Elements:

Present Value	–915
Future Value	1175
Payments	47.5 (9.5% of 1000 ÷ 2)
Number of periods	18 (9 × 2)
Interest	solve for (× 2 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
2, gold, P/YR	---
915, +/–, PV	915, CHS, PV
1175, FV	1175, FV
47.5, PMT	47.5, PMT
9, gold, ×P/YR	18, n
I/YR	i, 2, ×

Answer: 12.20%

Question 34: B

Elements:

Original investment	–80000
year 1	–50000
year 2	28000
year 3	316000 (750000 + 46000 – 480000)*

*Year 3's income is the sale price plus the positive cash flow minus the amount owed from the mortgage.

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
80000, +/−, CFj	80000, CHS, g, CFo
50000, +/−, CFj	50000, CHS, g, CFj
28000, CFj	28000, g, CFj
316000, CFj	316000, g, CFj
gold, IRR/YR	f, IRR

Answer: 46.21%

Question 35: A

Elements:

Present Value	solve for
Future Value	1000
Payments	30 (6% of 1000 ÷ 2)
Number of periods	10 (5 × 2)
Interest	5.5 (÷ 2 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
2, gold, P/YR	---
1000, FV	1000, FV
30, PMT	30, PMT
5, gold, ×P/YR	10, n
5.5, I/YR	5.5, ENTER, 2, ÷, i
PV	PV

Answer: $1,021.60

Question 36: B

Elements:

Present Value	solve for
Future Value	1000
Payments	48.75 (9.75% of 1000 ÷ 2)
Number of periods	50 (25 × 2)
Interest	8.5 (÷ 2 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
2, gold, P/YR	---
1000, FV	1000, FV
48.75, PMT	48.75, PMT
25, gold, ×P/YR	50, n
8.5, I/YR	8.5, ENTER, 2, ÷, i
PV	PV

Answer: $1,128.71

Question 37: A

First determine the annual amount needed in year one of retirement by inflating the amount in today's dollars by the inflation rate for the number of years before retirement (this is what we've been referring to as "step 1").

Elements:

Present Value	–80000
Future Value	solve for
Payments	N/A
Number of periods	19
Interest	4

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
80000, +/–, PV	80000, CHS, PV
19, N	19, n
4, I/YR	4, i
FV	FV

Answer: $168,548

Next, determine the lump-sum amount required at the beginning of retirement (this is what we've been referring to as "step 2"). Notice this is the answer the problem is asking for, so this problem does not have a "step 3" element.

Elements:

Present Value	solve for
Future Value	N/A
Payments	168548 (FV from Step 1—use **begin mode**)
Number of periods	30
Interest	$\left[\dfrac{1 + .06}{1 + .04} - 1\right] \times 100$

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
gold, Beg/End (display shows BEG)	g, BEG
168548, +/–, PMT	168548, CHS, PMT
1.06, ÷, 1.04, =, –, 1, =, ×, 100, =, I/YR	1.06, ENTER, 1.04, ÷, 1, –, 100, ×, i
30, N	30, n
PV	PV

Answer: $3,888,479

Question 38: C

This problem requires all three steps.

Step 1:
Elements:

Present Value	–25000
Future Value	solve for
Payments	N/A
Number of periods	11
Interest	6.5

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
25000, +/–, PV	25000, CHS, PV
11, N	11, n
6.5, I/YR	6.5, i
FV	FV

Answer: $49,979

Step 2:

Elements:

Present Value	solve for
Future Value	N/A
Payments	49979 (FV from Step 1—use **begin mode**)
Number of periods	4
Interest	$\left[\dfrac{1\ +\ .08}{1\ +\ .065} - 1\right] \times 100$

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
gold, Beg/End (display shows BEG)	g, BEG
49979, +/–, PMT	49979, CHS, PMT
1.08, ÷, 1.065, =, –, 1, =, ×, 100, =, I/YR	1.08, ENTER, 1.065, ÷, 1, –, 100, ×, i
4, N	4, n
PV	PV

Answer: $195,790

Step 3:

Elements:

Present Value	N/A
Future Value	195790
Payments	solve for
Number of periods	11
Interest	8

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
gold, Beg/End (display clears)	g, END
195790, FV	195790, FV
11, N	11, n
8, I/YR	8, i
PMT	PMT

Answer: $11,762

Question 39: D

Step 1:

Elements:

Present Value	–44000 (80% of 100,000 less 36,000 Social Security)
Future Value	solve for
Payments	N/A
Number of periods	13
Interest	3

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
44000, +/–, PV	44000, CHS, PV
13, N	13, n
3, I/YR	3, i
FV	FV

Answer: $64,615

Step 2:

Elements:

Present Value	solve for
Future Value	N/A
Payments	64615 (FV from Step 1—use **begin mode**)
Number of periods	28
Interest	$\left[\dfrac{1 + .06}{1 + .03} - 1\right] \times 100$

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
gold, Beg/End (display shows BEG)	g, BEG
64615, +/–, PMT	64615, CHS, PMT
1.06, ÷, 1.03, =, –, 1, =, ×, 100, =, I/YR	1.06, ENTER, 1.03, ÷, 1, –, 100, ×, i
28, N	28, n
PV	PV

Answer: $1,261,192

Step 3:

Elements:

Present Value	N/A
Future Value	1261192
Payments	solve for
Number of periods	13
Interest	6

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
gold, Beg/End (display clears)	g, END
1261192, FV	1261192, FV
13, N	13, n
6, I/YR	6, i
PMT	PMT

Answer: $66,793

Question 40: D

Whenever the question indicates that investors want to live off interest income only, i.e., not spend their principal, the calculation is simply the amount needed per year divided by the expected rate of return. If the problem indicates that the amount is needed at the beginning of the period, you will need to add the annual amount required to the lump-sum calculated by dividing the annual amount by the rate of return. In this case:

$$\text{Rate of return} = \left[\frac{1 + .1}{1 + .05} - 1 \right] = .04762$$
$$100,000 \div .04762 + 100,000 = 2,199,958 \text{ (round up to 2,200,000)}$$

Question 41: B

Step 1:

Elements:

Present Value	–42000 (80% of 90,000 = 72,000 less 30,000 per year Social Security)
Future Value	solve for
Payments	N/A
Number of periods	20
Interest	3

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
42000, +/–, PV	42000, CHS, PV
20, N	20, n
3, I/YR	3, i
FV	FV

Answer: $75,857

Step 2:

Elements:

Present Value	solve for
Future Value	N/A
Payments	75857 (FV from Step 1—use **begin mode**)
Number of periods	20
Interest	$\left[\dfrac{1 \; + \; .1}{1 \; + \; .03} - 1\right] \times 100$

Keystrokes:

10B	12C
gold, clear all	f, CLX
1, gold, P/YR	---
gold, Beg/End (display shows BEG)	g, BEG
75857, +/–, PMT	75857, CHS, PMT
1.1, ÷, 1.03, =, –, 1, =, ×, 100, =, I/YR	1.1, ENTER, 1.03, ÷, 1, –, 100, ×, i
20, N	20, n
PV	PV

Answer: $872,016

Step 3:

Elements:

Present Value	N/A
Future Value	872016
Payments	solve for
Number of periods	240 (20 × 12)
Interest	10 (÷ 12 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
12, gold, P/YR	---
gold, Beg/End (display clears)	g, END
872016, FV	872016, FV
20, gold, ×P/YR	240, n
10, I/YR	10, ENTER, 12, ÷, i
PMT	PMT

Answer: $1,148

Question 42: C

Note: This problem is asking only what monthly investment needs to be made to accumulate the target amount ($485,000); therefore, it is a "Step 3" problem only. The information about CPI and college inflation is superfluous and meant to trick you into thinking you need to complete more steps. Your calculator should be in End mode for this problem.

Elements:

Present Value	N/A
Future Value	485000
Payments	solve for
Number of periods	192 (16 × 12)
Interest	5 (÷ 12 for 12C)

Keystrokes:

10B	12C
gold, clear all	f, CLX
12, gold, P/YR	---
485000, FV	485000, FV
16, gold, ×P/YR	192, n
5, I/YR	5, ENTER, 12, ÷, i
PMT	PMT

Answer: $1,654