

Homework Problems for Amount of Money at Compound Interest (Formulas 1 and 2 on the Formulas Handout)

Sample Problem Suggestions: To get the best use of these problems in studying for the exam, I would suggest the following method:

- 1) Do the problem.
- 2) Compare your answer with the correct answer (at the end of the document). If they are the same, do another problem! If they differ, do the problem again and compare your answer again. If they still differ, get the study problems with the solutions worked out and compare those solutions carefully to your written solution. If you can't find where you are doing something wrong, get help from a tutor or email me with the problem number and your answer.
- 4) Problems 1 through 10 involve finding the amount of money in an investment after a given period of time. They are the easier set.
- 5) Problems 11-20 involve finding the number of years required for an investment to grow to a certain amount. They are a little harder.

Sample Problems for Formulas 1 and 2

Problem 1. Suppose you invest \$7,500 into an account earning 2.5% annual interest compounded continuously. How much will be in the account after 5 years?

Problem 2. Suppose you invest \$5,000 into an account earning 15% annual interest compounded daily. How much will be in the account after 5 years?

Problem 3. Suppose you invest \$8,000 into an account earning 16.5% annual interest compounded continuously. How much will be in the account after 10 years?

Problem 4. Suppose you invest \$500 into an account earning 3% annual interest compounded quarterly. How much will be in the account after 10 years?

Problem 5. Suppose you invest \$3,000 into an account earning 7% annual interest compounded continuously. How much will be in the account after 10 years?

Problem 6. Suppose you invest \$7,500 into an account earning 8.5% annual interest compounded monthly. How much will be in the account after 10 years?

Problem 7. Suppose you invest \$3,000 into an account earning 10.5% annual interest compounded continuously. How much will be in the account after 5 years?

Problem 8. Suppose you invest \$9,500 into an account earning 6% annual interest compounded semi-annually. How much will be in the account after 5 years?

Problem 9. Suppose you invest \$5,500 into an account earning 7% annual interest compounded continuously. How much will be in the account after 19 years?

Problem 10. Suppose you invest \$6,000 into an account earning 9.5% annual interest compounded annually. How much will be in the account after 19 years?

Problem 11. Suppose you want to have \$10,000 in 5 years by putting an amount into a savings account paying 4% annual interest compounded continuously. How much should you put into the account?

Problem 12. Suppose you want to have \$10,000 in 5 years by putting an amount into a savings account paying 4% annual interest compounded monthly. How much should you put into the account?

Problem 13. Suppose you want to have \$10,000 by putting \$5,000 into a savings account paying 3% annual interest compounded continuously. How many years will it take for your initial amount to grow to the desired amount?

Problem 14. Suppose you want to have \$10,000 by putting \$5,000 into a savings account paying 3% annual interest compounded quarterly. How many years will it take for your initial amount to grow to the desired amount?

Problem 15. Suppose you want to deposit \$5,000 into a savings account paying continuously compounded interest for 20 years. If you wish to have \$10,000 at the end of that time, what interest rate will you need to have?

Answers:

Problem 1: Answer: \$ 8,498.61	Problem 9: Answer: \$ 20,795.74
Problem 2: Answer: \$ 10,583.35	Problem 10: Answer: \$ 33,652.67
Problem 3: Answer: \$ 41,655.84	Problem 11: Answer: \$8,187.31
Problem 4: Answer: \$ 674.17	Problem 12: Answer: \$8,190.03
Problem 5: Answer: \$ 6,041.26	Problem 13: 17.329 years
Problem 6: Answer: \$ 17,494.85	Problem 14: Answer: 23.191 years
Problem 7: Answer: \$ 5,071.38	Problem 15: Answer: 3.47%
Problem 8: Answer: \$ 12,767.21	

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- 3) Problems 1 through 10 involve finding the amount of money in an investment after a given period of time. They are the easier set.
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Good luck on the Final Exam!

***Sample Problems for Formulas 3 and 4 and 7***

Problem 16. Suppose you pay \$50 into a retirement account earning 2.5% annual interest at the end of every month for 15 years. How much will you have at the end of that time?

Problem 17. Suppose you pay \$90 into a retirement account earning 2.5% annual interest at the end of every month for 15 years. How much will you have at the end of that time?

Problem 18. Suppose you pay \$60 into a retirement account earning 1.9% annual interest at the beginning of every month for 25 years. How much will you have at the end of that time?

Problem 19. Suppose you pay \$80 into a retirement account earning 2.2% annual interest at the beginning of every month for 28 years. How much will you have at the end of that time?

Problem 20. Suppose you borrow \$175,000 at 6.3% for 30 years (monthly payments). What will your payments be? How much interest will you pay on this loan?

Problem 21. Suppose you borrow \$175,000 at 6.3% for 12 years (monthly payments). What will your payments be? How much interest will you pay on this loan?

Problem 22. Suppose you borrow \$175,000 at 6.3% for 30 years (monthly payments). What will your payments be? How much interest will you pay on this loan?

Problem 23. Suppose you borrow \$175,000 at 6.3% for 12 years (monthly payments). What will your payments be? How much interest will you pay on this loan?

Problem 24. Suppose you want to have \$500,000 to retire on in 20 years by paying into a monthly annuity paying 4% at the end of each month. How much will you need to pay each month?

Problem 25. Suppose you want to have \$500,000 to retire on in 20 years by paying into a monthly annuity paying 4% at the beginning of each month. How much will you need to pay each month?

Problem 26:

Problem 27:

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Answers

Problem 16 Answer: \$ 10,906.17

Problem 17 Answer: \$ 19,631.11

Problem 18 Answer: \$ 23,054.10

Problem 19 Answer: \$ 37,179.16

Problem 20 Answer:  
\$ 1,083.20 payment,  
\$ 214,952.00 interest

Problem 21 Answer:  
\$ 1,735.03 payment,  
\$ 74,844.32 interest

Problem 22 Answer:  
\$ 1,083.20 payment,  
\$ 214,952.00 interest

Problem 23 Answer:  
\$ 1,735.03 payment,  
\$ 74,844.32 interest

Problem 24 Answer: \$ 1363.23

Problem 25 Answer: \$ 1358.71

Problem 26 Answer:

Problem 27 Answer: