

Check Your Understanding Financial Math – Compound Interest 2

The table below identifies some key concepts from this unit. Complete each question, check your answers, and get help as needed.

Key Concepts	Basic Questions	Intermediate Questions	Advanced Questions
Solving for C	1, 2	3, 4	5
Solving for a and r	6, 7	7, 8, 9	10
Solving for n		11, 12	13
Putting it all together		14	15, 16

1) You invested \$850 in an account earning an annual compound interest rate of 3.7%. What is the value of your investment after 6 years?

2) Foxes have made their home in a nature reserve. The population of foxes is declining by 12% per year (compounded annually). The fox population is currently 350. What will the fox population be in 4 years? **Round to the nearest whole number.**

3) You invest \$1100 in an account earning a monthly compound interest rate of 0.7%. What is the value of your investment after 8 years?

4) Cells in a petri dish grow exponentially (the population can be determined using compound interest formula). The population of cells doubles every hour. There are currently 12 cells. How many cells will there be in 1 days?

5) A house has been infested by termites. The termite population triples every 4 years. If there are currently 643 termites in the house, how many will there be in 9 years? **Round to the nearest whole number.**

6) 4 years ago, you purchased a car. It is now worth \$8750. The value of the car depreciates by 18% compounded annually. What was the original value of the car?

7) You invested \$1783 in an account earning an annual compound interest rate. 3 years later the account is worth \$2475. What was the annual compound interest rate?

8) The population of a town has been increasing by 0.4% annually. The town currently has a population of 8530. What was the population 85 months ago? **Round to the nearest whole number.**

9) You purchased a phone 7 months ago for \$725. The value of the phone is now \$480. What is the annual compound rate of depreciation?

10) 21 days ago the owners of a house discovered there was an ant infestation. The owners of the house were promised that the ant population would decrease by half every three days, if they hired an extermination company to spray insecticide. If there are currently 80 ants in the house, how many ants were in the house when the owners originally discovered the problem?

11) You invest \$1250 in an account earning an annual compound interest rate of 3.2%. How long will it take for your investment to be worth \$1500?

12) The population of a town is decreasing at a rate of 8.4% annually. If the population is currently 7589, how long will it take for the population to be 6000?

13) A population of fish is increasing at a rate of 4.5% every 2 months. If there are currently 47 fish in the lake, how long will it take for the population to reach 130? **Round to the nearest month.**

14) You have \$850 to invest in an account, and are trying to decide between two investments in order to make the most money.

Investment A

This investment offers a 3.2% annual compound interest rate and you could keep the money in the investment for 4 years.

Investment B

This investment offers a 2.9% annual compound interest rate and you could keep the money in the investment for 4.5 years.

Which investment would earn more money?

15) A lake contains two species of fish, carp and perch. The population of carp will equal the population of perch in 5 years.

Carp

The population of carp is increasing at a rate of 0.95% per month. There are currently 173 carp in the lake.

Perch

The population of perch is decreasing at a rate of 1.2% per month.

What is the current population of perch in the lake? (round to the nearest whole number)

16) You are saving money to purchase a car. You estimate that you will need \$18 500 to purchase a car in 4 years. You will invest in **both** Investment A and Investment B

Investment A

You will invest \$5000 in an account offering a twice-monthly compound interest rate of 0.75%.

Investment B

This investment offers a monthly compound interest rate of 1.2%.

How much do you need to invest in Investment B to have enough money to purchase the car?

Answer Key

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|---|--|
| 1) Investment is worth \$1057.04 | 9) Annual rate of depreciation is 50.68% |
| 2) 210 foxes | 10) 10 256 ants |
| 3) Investment is worth \$2148.93 | 11) 5.79 years |
| 4) 201 326 592 cells | 12) 2.68 years |
| 5) 7616 termites | 13) 46 months |
| 6) Car's original value: \$19 354.13 | 14) Investment B |
| 7) 11.55% annual compound interest rate | 15) Currently 629 perch |
| 8) 8292 people | 16) Initially invested \$4656.70 in Investment B |