

# Compound Interest

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Score: \_\_\_\_\_ / 18

## Quick Review and Helpful Hints

*Compound interest* earns interest on the interest already earned. For yearly compounding, the amount is  $A = P(1 + r)^t$ , where  $P$  is the principal,  $r$  is the rate (as a decimal), and  $t$  is the number of years. The interest earned is  $A - P$ .

▷ **Example:** Find the amount on \$100 at 10% for 2 years (compounded yearly). **Work:**  $A = 100(1.10)^2 = 100(1.21)$ .

★ **Answer:** \$121



Interest grows on interest.

### Practice Problems

Find the amount (or interest, where asked).

- |   |  |
|---|--|
| <p>1. \$100 at 10%, 1 yr _____</p> <p>2. \$100 at 10%, 2 yr _____</p> <p>3. \$200 at 10%, 1 yr _____</p> <p>4. \$100 at 20%, 1 yr _____</p> <p>5. \$100 at 100%, 1 yr _____</p> <p>6. \$500 at 10%, 1 yr _____</p> <p>7. \$100 at 50%, 1 yr _____</p> | <p>8. \$1000 at 10%, 1 yr _____</p> <p>9. \$100 at 10%, 2 yr: interest only _____</p> <p>10. \$200 at 10%, 2 yr _____</p> <p>11. \$100 at 5%, 1 yr _____</p> <p>12. \$400 at 25%, 1 yr _____</p> <p>13. \$100 at 10%, 3 yr _____</p> <p>14. \$1000 at 100%, 1 yr _____</p> |
|---|--|

### Word Problems

15. \$1000 grows at 10% for 2 years (yearly). Find the final amount. \_\_\_\_\_
16. \$100 grows at 10% for 2 years. How much interest is earned? \_\_\_\_\_
17. \$500 grows at 20% for 1 year. Find the amount. \_\_\_\_\_
18. \$200 grows at 50% for 1 year. Find the amount. \_\_\_\_\_



## Answer Keys

- |          |           |              |
|----------|-----------|--------------|
| 1. \$110 | 7. \$150  | 13. \$133.10 |
| 2. \$121 | 8. \$1100 | 14. \$2000   |
| 3. \$220 | 9. \$21   | 15. \$1210   |
| 4. \$120 | 10. \$242 | 16. \$21     |
| 5. \$200 | 11. \$105 | 17. \$600    |
| 6. \$550 | 12. \$500 | 18. \$300    |

### Step-by-Step Explanations

1. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $100(1.10) = \$110$ . So the final answer is \$110.
2. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $100(1.10)^2 = 100(1.21) = \$121$ . So the final answer is \$121.
3. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $200(1.10) = \$220$ . So the final answer is \$220.
4. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $100(1.20) = \$120$ . So the final answer is \$120.
5. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $100(2.00) = \$200$ . So the final answer is \$200.
6. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $500(1.10) = \$550$ . So the final answer is \$550.
7. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $100(1.50) = \$150$ . So the final answer is \$150.
8. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $1000(1.10) = \$1100$ . So the final answer is \$1100.
9. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $121 - 100 = \$21$ . So the final answer is \$21.
10. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $200(1.21) = \$242$ . So the final answer is \$242.
11. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $100(1.05) = \$105$ . So the final answer is \$105.
12. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $400(1.25) = \$500$ . So the final answer is \$500.
13. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $100(1.10)^3 = 100(1.331) = \$133.10$ . So the final answer is \$133.10.
14. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $1000(2.00) = \$2000$ . So the final answer is \$2000.
15. Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $1000(1.10)^2 = 1000(1.21) = \$1210$ . So the final answer is \$1210.
16. Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $121 - 100 = \$21$ . So the final answer is \$21.
17. Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $500(1.20) = \$600$ . So the final answer is \$600.
18. A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is  $200(1.50) = \$300$ . So the final answer is \$300.



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